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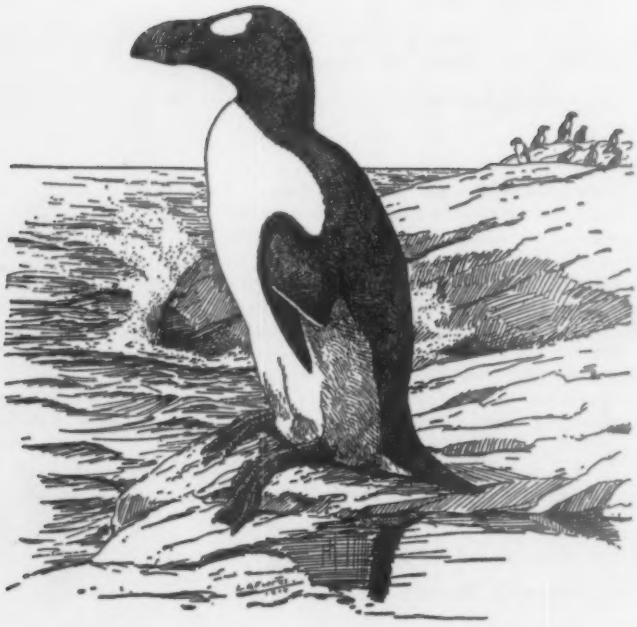

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BRAZILIAN MERGANSERS, from a painting by Don R. Eckelberry

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NOTES ON THE BRAZILIAN MERGANSER IN ARGENTINA

BY WILLIAM H. PARTRIDGE

WHILE on ornithological field trips in the Province of Misiones (Argentina) between 1949 and 1954, I was able to gather a few notes on the habits of the rare Brazilian Merganser (*Mergus octosetaceus*). On these trips, sponsored by the Buenos Aires Natural History Museum, our main purpose was to collect specimens and data for a complete analysis of the avifauna of the region; some extra time was devoted to this species, because of its rarity. So little is known about this merganser, that my observations, along with a summary of our present knowledge of the species, may be of some interest to ornithologists.

This curious duck, the only South American merganser, was first described by Vieillot in 1817 (Nouv. Dict. Hist. Nat. nouv. ed., 14, p. 222), probably from specimens taken in Brazil by Delalande (Berlioz, 1929: 68–89). Since then it has been reported on only a few occasions. It was found in Brazil by Natterer during his travels between 1817 and 1835 on the Rio Itararé, São Paulo, and at Guarda-Mór, Minas Gerais (Pelzeln, 1868–70: 322). Friedrich Sellow secured specimens of the Brazilian Merganser during his travels (1818 and 1819) in Rio de Janeiro, Minas Gerais, and São Paulo. Although these specimens (now in the Berlin Museum) are simply labelled "Minas," they were probably obtained early in 1819 when the travelers followed the Rio das Velhas down to the Rio São Francisco (Stresemann, *in litt.* April 22, 1952; see also Stresemann, 1935: 121; 1948; and 1954: 52). Burmeister (1856: 442) and Schlüter (cf. Berlepsch, 1874: 281) found the Brazilian Merganser in Santa Catarina; two additional specimens from this state are in the Berlin Museum (Stresemann, 1935: 121; 1954: 52).

In 1903 another specimen was secured in São Paulo (Rio Paranapanema) by Hempell (cf. Pinto, 1938: 58). The last specimen known

to have been taken in Brazil is mentioned by Sztolcman (1926: 121); it was collected in the state of Paraná (Rio Ivaí, Salto da Ariranha) by Chrostowski in 1922.

According to Bertoni (1901: 8), the Brazilian Merganser also inhabited small streams in Paraguay along the Paraguayan side of the Alto Paraná River drainage.

Up to 1947, only three specimens of the Brazilian Merganser from Argentina were known in museum collections; two of them in the Buenos Aires Museum. The first specimen known to have been collected in Argentina was taken in Arroyo Garuhapé (Misiones) by Ramón Lista in September, 1882. This specimen (unsexed, but probably a male) was mentioned by Lista (1883: 90) in a non-technical report of his travels through Misiones; it was mentioned again by Dabbene (1910: 234; 1914: 297) but without a complete statement of its origin. A second specimen, also taken in Misiones, was given to the Buenos Aires Museum in 1914 along with some mounted birds from a collection owned by Señor Antonio Núnez of Buenos Aires. None of the specimens in this collection has data except for the Brazilian Merganser, and it has an old museum label which was probably attached to the specimen, because of its rarity, after it entered the Museum. F. M. Rodriguez collected the specimen, a female, but no date is given. The locality first written on the label ("Santa Ana, Misiones") was later changed, in different handwriting, to "Saltos de Iguazú" (Iguazú River Falls, Misiones). Because Santa Ana was the headquarters of Rodriguez (a professional collector working at that time for the Buenos Aires Museum), there was probably no hesitation in ascribing that locality to the skin. Later the mistake was discovered, perhaps by Rodriguez himself during one of his visits to the Museum. A description of this specimen, with the first (erroneous) locality attributed to it, is given by Phillips (1926: 302); this description was based on notes taken by the late J. L. Peters during his visit to Argentina in 1920 and 1921.

The third specimen known from Argentina, an adult male, was collected by Johan Mogensen on April 30, 1912, in Bonpland, Misiones (probably collected on the Yaveviri River). It is in the Shipton Collection, Miguel Lillo Institute of Tucumán University (Tucumán, Argentina). See Mogensen (1930: 208).

From 1922 to 1947 nothing more was learned about this duck. In October, 1947, an expedition from the Buenos Aires Museum made a short reconnaissance along the Yacuy River, a small tributary of the Iguazú, in northern Misiones. The party was led by Dr. Eduardo del Ponte, then Chief of the Department of Zoology in the Museum.

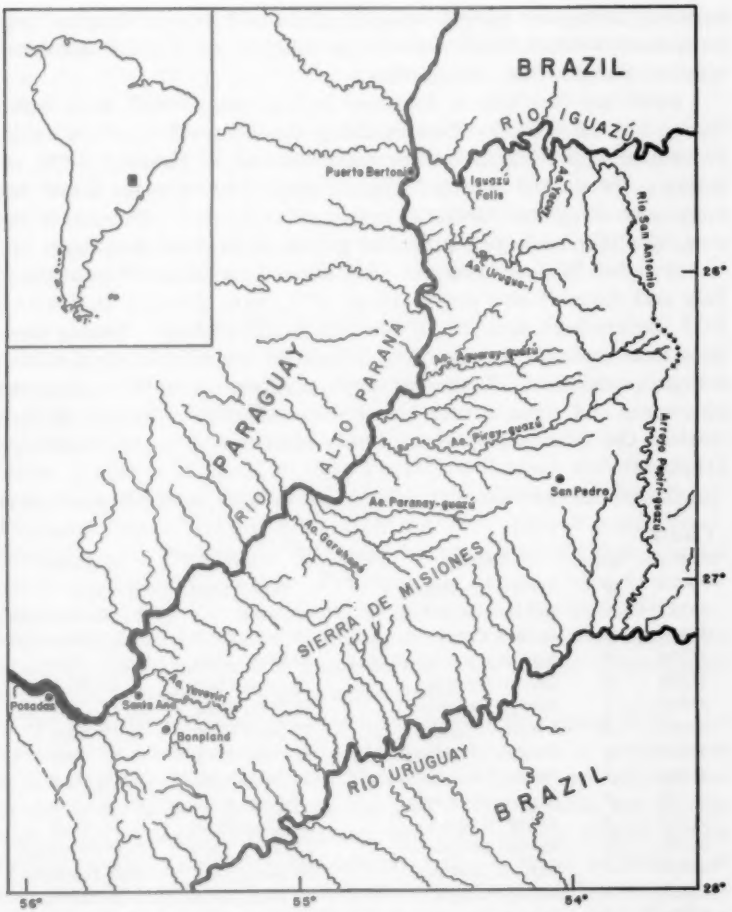


FIGURE 1. Map showing the rivers where the Brazilian Merganser was found in the Province of Misiones, Argentina.

Although the main object of the expedition was to conduct field research on medical entomology, a small collection of birds was made with the assistance of Señor Alberto A. Aiello. Among these birds was a new specimen of the Brazilian Merganser. The reappearance of this species aroused much interest among ornithologists in Buenos Aires. Señor Andrés G. Giai, commissioned by the Buenos Aires Museum, left for Misiones in April, 1948. After five months of

searching along the Arroyo Aguaray-guazú and Arroyo Urugua-i (not to be confused with Rio Uruguay), he collected eight additional specimens of the Brazilian Merganser.

I made my first trip to Misiones in September, 1949, with Señor Giai. We did general collecting along the Arroyo Urugua-i through November and returned to the same locality in January, 1950, remaining there until March. During these two trips we found the merganser along the Arroyo Urugua-i several times. Because of the scarcity of the bird, we limited our collecting to three specimens.

I revisited Misiones twice in 1951 (from January to March and in July and August) and once each in 1952 (from January to March), 1953 (September), and 1954 (from July to December). During these trips I encountered the Brazilian Merganser on several occasions and collected specimens. In August, 1954, the first nest of the species was discovered and three downy young were collected. Other specimens reached the Museum by way of two trained native collectors from Misiones.

A list of the specimens of *Mergus octosetaceus* in the Buenos Aires

Catalog Number	*Sex*	*Locality*	*Date*	*Collector*
—	♂	Arroyo Garuhapé	Sept., 1882	R. Lista
8521	♀	Rio Iguazú, Saltos	None	F. M. Rodriguez
30603	♀	Arroyo Yacuy	2 Oct., 1947	del Ponte-Aiello
31328	♂	Arroyo Aguaray-guazú	29 May, 1948	A. G. Giai
31329	♂	Arroyo Urugua-i	20 July, 1948	A. G. Giai
31330	♀	Arroyo Urugua-i	22 July, 1948	A. G. Giai
31331	♂	Arroyo Urugua-i	22 July, 1948	A. G. Giai
31332	♀	Arroyo Urugua-i	22 July, 1948	A. G. Giai
31333	♂	Arroyo Urugua-i	28 July, 1948	A. G. Giai
31334	♂	Arroyo Urugua-i	4 Aug., 1948	A. G. Giai
31335	♂	Arroyo Urugua-i	20 Aug., 1948	A. G. Giai
31760	♀	Arroyo Urugua-i	12 Sept., 1949	Giai-Partridge
32367	♂	Arroyo Urugua-i	24 Mar., 1950	Giai-Partridge
32368	♀	Arroyo Urugua-i	24 Mar., 1950	Giai-Partridge
33204	♂	Arroyo Piray-guazú	3 May, 1951	M. Salas
33245	♂	Arroyo Urugua-i	16 Aug., 1951	W. H. Partridge
33246	♀	Arroyo Urugua-i	16 Aug., 1951	W. H. Partridge
33455	♀	Arroyo Urugua-i	14 Mar., 1952	W. H. Partridge
33868	♂	Arroyo Urugua-i	17 May, 1952	M. Salas
33869	♂	Arroyo Urugua-i	18 May, 1952	M. Salas
33902	♀	Arroyo Piray-guazú	25 Aug., 1952	A. Rivas
36576	Young	Arroyo Urugua-i	31 Aug., 1954	W. H. Partridge
36577	Young	Arroyo Urugua-i	31 Aug., 1954	W. H. Partridge
36578	Young	Arroyo Urugua-i	1 Sept., 1954	W. H. Partridge
36579	♀	Arroyo Urugua-i	1 Sept., 1954	W. H. Partridge
36580	♀	Arroyo Urugua-i	12 Dec., 1954	W. H. Partridge

Museum is given on page 476. I have already mentioned some of these specimens in a previous paper (1954: 94) and others have been listed by Giai (1951: 255). All the localities mentioned are in the Province of Misiones, Argentina.

Of the above specimens, No. 31334 has been sent in exchange to the United States National Museum in Washington, D. C. Not mentioned in the above list are a pair collected in Arroyo Piray-guazú and sent to the American Museum of Natural History in New York and a male from the same locality sent to the University of Michigan Museum of Zoology in Ann Arbor.

DISTRIBUTION AND STATUS

All the available locality records indicate that the Brazilian Merganser is restricted to southeastern Brazil and the neighboring regions of Paraguay and Argentina.

The species has been reported from the following localities. *Brazil:* Minas Gerais (Guarda-Mór), São Paulo (Rio Itararé and Rio Paranapanema), Paraná (Rio Ivaí), and Santa Catarina (Blumenau); *Paraguay:* small streams that flow into the Alto Paraná River; *Argentina:* the Province of Misiones, tributaries of the Alto Paraná (Arroyo Garuhapé, Arroyo Piray-guazú, Arroyo Aguaray-guazú, Arroyo Urugua-i, Rio Iguazú, and its tributary Arroyo Yacuy).

The Brazilian Merganser is undoubtedly a year-round resident in Misiones. The species will probably also prove to be a permanent resident in its range in Paraguay and Brazil.

The following observations lead us to believe that many rivers and streams in Misiones are inhabited by isolated, sedentary populations of the Brazilian Merganser. In Misiones, we have found the species in the same district throughout the year. These ducks are usually seen in pairs, distributed along the rivers, apparently within certain limited areas. Our field observations make it seem unlikely that members of a pair ever abandon their territory; furthermore, they may spend their entire lives along one river or stream. We have found them flying up and down stream very close to the surface of the water and never deviating from the river's course. I have never seen the Brazilian Merganser flying over the forest even along the shore of the river. During our explorations along the rivers we have frequently seen these ducks in flight; they never crossed over into the surrounding forest even after we shot at them from the canoe. When frightened they hurried their flight over us or shifted their flight paths toward a side of the river close to the shady, forested shores. These observations tempt us to believe that it is unlikely that the mergansers move

from one stream to another over large intervening areas of densely forested country. The rivers of Misiones are tributaries of the Paraná, which is the only water connection between them; the Brazilian Merganser has never been found on the Paraná. Even Bertoni, who has lived many years in the Alto Paraná region of Paraguay and is undoubtedly a reliable bird-watcher, has never seen this merganser on the Paraná.

Up to 1947 there were so few records of the Brazilian Merganser that the status of the species was not known; some authors even considered it nearly, if not already extinct (Phillips, 1929: 534). There were several unsuccessful attempts, prior to 1947, to find the species. F. M. Rodriguez of Misiones, who for many years has collected birds for the Buenos Aires Natural History Museum, was asked to secure new specimens; but he failed to find the species (Hornero, 5: 233, 1933). Other unsuccessful attempts were made by the late J. L. Peters and H. B. Conover, who visited Misiones in search of the merganser and failed to find it (Phillips, 1926: 302).

There has been much ornithological work in the extensive area supposed to be inhabited by this duck in Brazil. Recently the Departmento de Zoologia (formerly Museu Paulista) of São Paulo, Brazil, has been thoroughly exploring much of southeastern Brazil, but there are no new records of the Brazilian Merganser from that region. Probably the most exhaustive collecting trip to southeastern Brazil was the one conducted by Emil Kaempfer, 1926 through 1931, for the American Museum of Natural History, New York (Naumburg, 1935). During his five years in the region, Kaempfer sent about 10,000 specimens of birds to the American Museum, but no Brazilian Merganser was among them.

I am not sure that this merganser is as rare in Brazil as the above facts suggest; light may be shed on the problem by our own discovery of the Brazilian Merganser in Misiones where it inhabits nearly all the tributaries of the Paraná, mostly small, that we have explored. From our experience in Misiones, we have learned that this species is found only along the small rivers and streams that run down from the highlands in the interior of the province and into the Alto Paraná. A thorough search along the many tributaries on the western side of the Paraná drainage in Paraguay will probably reveal that the Brazilian Merganser has a similar status in that area.

Protection of the Brazilian Merganser is at present no problem as man is not a serious threat to the species. Native settlers will not hunt the mergansers because of their unpalatability, and sportsmen will never enter wild and unhealthy regions after a scarce bird of no importance as game.

HABITAT

The Province of Misiones is a narrow district between the Paraná and Uruguay rivers. It is similar in nature to the neighboring states of Paraná and Santa Catarina in Brazil and to the Alto Paraná region in eastern Paraguay. In a faunistic sense, the whole area comprises the southern portion of the extensive highland region of eastern Brazil. Misiones is mainly tropical in climate and has an annual average rainfall of nearly 2,000 millimeters.

The tropical pine forest of southeastern Brazil, which extends over the states of São Paulo, Paraná, Santa Catarina, and part of Rio Grande do Sul, enters Argentina in a very limited area in northeastern Misiones where it grows in the highlands of the Sierra de Misiones. An outstanding feature of this forest is the handsome Brazilian Pine (*Araucaria angustifolia*), which grows in association with the Paraguayan Tea or "Yerba Mate" (*Ilex paraguayensis*). Toward the west, elevations are lower and the pine forest gives way to a more compact and homogeneous humid forest zone which occurs all along the Paraná River in Misiones, eastern Paraguay, and southern Brazil. In the midst of this magnificent tropical forest are those small rivers and streams where I became acquainted with the Brazilian Merganser.

In Misiones, the Sierra de Misiones, 500 to 700 meters in elevation, form a divide about midway between the Paraná and Uruguay rivers; to the eastward the watershed flows into the Uruguay and to the westward into the Paraná. The tributaries of the Paraná (Alto Paraná) are in general larger than those of the Uruguay. Along the west side of Misiones, from Posadas (capital of Misiones) northward to the Iguazú River, which is the boundary between Argentina and Brazil, there are many small streams and rivers flowing into the Paraná, the two largest being the Arroyo Piray-guazú and Arroyo Urugua-i. Most of these small rivers are probably inhabited by the Brazilian Merganser, and all the northern ones which we have explored are.

We are most familiar with the Urugua-i River, largest of all the tributaries of the Paraná. It flows from southeast to northwest for about 100 kilometers and crosses the whole province of Misiones from its eastern border to the Paraná River on the west. Starting near the Brazilian border as several small streams which later unite, the Urugua-i flows along a sinuous course through a region of gently rolling country. Many tributaries increase its volume, and it becomes a rather wide river, reaching in certain places a width of about 200 meters.

The rolling character of the country and the rocky nature of the river bed make the Urugua-i and the other tributaries of the Paraná

very wild; progress along the Urugua-i can be difficult because of the many rapids and small cataracts through which a canoe can be passed only by pulling it around boulders and battling the rushing current. The whole length of the Urugua-i is a continuous succession of stretches of quiet water and stretches of rapids and small waterfalls.

In the rainy season, heavy rains, sometimes lasting several days, raise the water level of the Urugua-i River so much that in a few hours it reaches the topmost part of the banks four or five meters up, and a powerful current sweeps along heavy trees and broken branches which will be left scattered about when the flood is over. During flood the river water becomes muddy, but in a few days it recovers its wonderful transparency, one of the outstanding features of all the Misiones rivers.

The Brazilian Merganser seems to find the proper habitat conditions on the tributaries of the Paraná, wild streams that flow through luxuriant tropical forest. All of these tributaries pass over waterfalls, which vary in size with the size of the tributary, before flowing into the Paraná. No migratory fishes incapable of passing over these waterfalls are above them. This is true of the Dorado (*Salminus maxillosus*), one of the most voracious fishes in the Alto Paraná River and a dangerous enemy to the downy young of any duck in its range. It is possibly of significance that the populations of Brazilian Merganser in Misiones have as their habitat the small, tributary water courses which are free from the danger of this fish. Our field experience leads us to believe that the upper reaches of these remote and inaccessible tributaries are natural refuges that will guarantee long survival of the Brazilian Merganser.

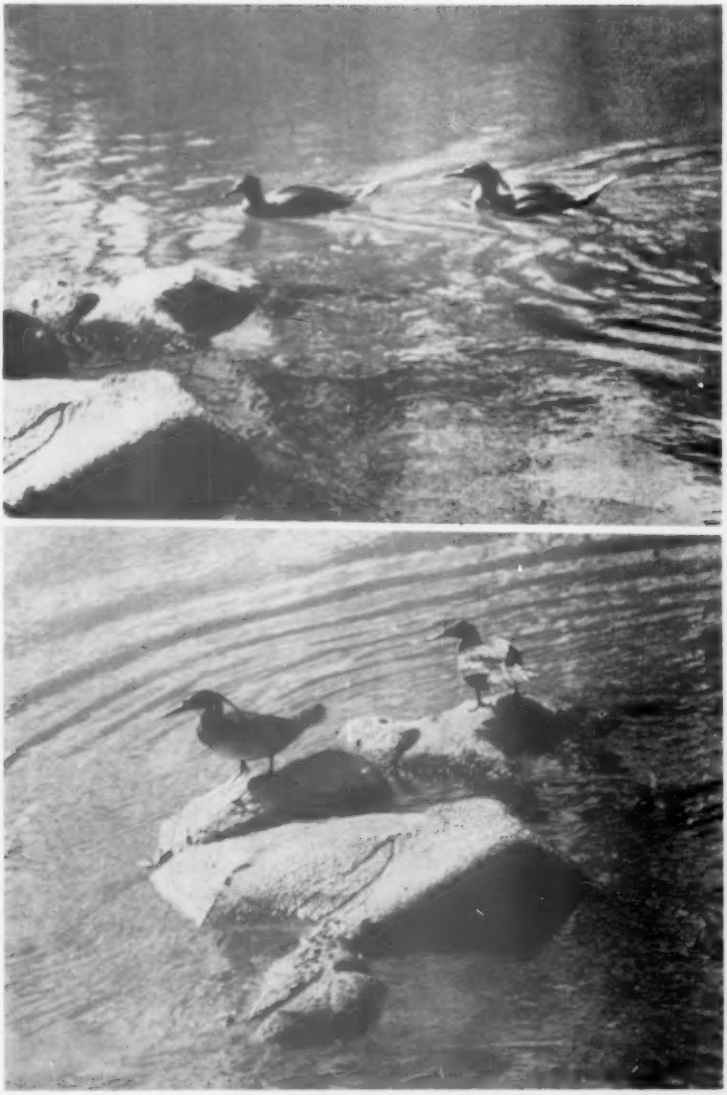
General Habits

Until recently the only information about the habits of the Brazilian Merganser was given by Bertoni (1901: 10); I have prepared the following English version of his account:

"*Habits.* They inhabit the silent streams that run through the undisturbed virgin forest, away from human populations, preferring the mouths [of streams and rivers]; from time to time they may come to the [Paraná] river shores. They go about in pairs or small groups. I have seen them during the winter. They fly swiftly but do not perform long flights. From their habits they appear to be sedentary birds. On the ground they run quickly, and it is a difficult task to follow them through the tangled trees and thickets; this explains why their legs are not placed as far back as in other ducks. When in the water, where they spend most of their time, they move swiftly. They

HABITAT OF THE BRAZILIAN MERGANSER NEAR KILOMETER 30 ON THE URUGUA-I RIVER, MISIONES, ARGENTINA. (*Above*) Still water near nesting site. (*Below*) Rapids, a regular feeding ground. Photographs by the author.

NEST SITE OF BRAZILIAN MERGANSER IN TREE ALONG THE URUGUA-I RIVER, DISCOVERED ON AUGUST 24, 1954. Arrow marks entrance to nest cavity. Photograph by the author.



PAIR OF BRAZILIAN MERGANSERS AT RESTING PLACE IN FRONT OF THE NEST TREE, AFTER FEEDING IN THE RAPIDS. Note shortened crest of the female. Photographs by the author.

THE DOWNY YOUNG OF THE BRAZILIAN MERGANSER (*Mergus octosetaceus*). This species lacks the rufous on the sides of the head characteristic of downy young of the North American mergansers. Wash drawing by William A. Lunk.

are good swimmers and can dive with great ability in pursuit of fish for a few seconds under water. They are voracious and I believe feed only on fish. If caught alive they fight hard to escape; they do not become tame but remain shy and wild. One that I had alive refused to take food and died in ten days time. Nevertheless it was fairly intelligent. Its flesh did not smell bad. The species is very rare."

After the recent rediscovery of this duck in Misiones, some further remarks on general habits were contributed by Giai (1950: 159) based on observations made during his first trip in 1948.

Wariness.—One of the outstanding characteristics of this rare duck is its extreme shyness. Brazilian Mergansers are always cautious and alert. A few of my observations are exceptions to the general rule. I stayed the whole month of August, 1951, in a small wooden house by the Arroyo Urugua-i "kilometer 10" near the bridge where the road to Iguazú crosses the river. The river can be seen from the house in front of which there is a large "corredera" (rapids), which makes the mighty Urugua-i roar day and night. Very soon after my arrival I learned that these rapids were the feeding grounds for two pairs of Brazilian Mergansers. Hidden on the shore, I spent many hours watching the movements of these ducks through my field glasses. This was the only time I saw more than two birds in one place; on some days there were only two or three, but usually members of a pair stayed together. These pairs often engaged in mating displays, which may be the reason they sometimes seemed fearless and did not seem to notice my presence even when I purposely showed myself.

Brazilian Mergansers can very seldom be approached on the water unless one comes on them suddenly around the bend of a river. One evening in February, 1951, while paddling along a straight section of the Urugua-i River, we caught sight of a pair of mergansers near a rapids; one of the birds was standing on a stone and the other was in the water. We were about 300 meters from them and could observe them with the help of our binoculars; they became alert as soon as they discovered us. Judging by their movements they were nervous, and they soon flew down the river away from us. On many other occasions we were unable to approach them along the river to within gunshot.

Daily movements.—Brazilian Mergansers are active day-feeders; they feed mostly along the rapids where fish are abundant and easy to obtain. During the day they may be seen either perching on rocks or diving for food. They are most active in the morning and evening. We have never found them active during the night in our travels

along the rivers. They sleep perched on stones and low branches at the shore, or on fallen trees projecting from the surface of the water. Although we have often hunted at night along the rivers of Misiones, we have seldom found Brazilian Mergansers at their roosting places.

Gait, swimming, and diving.—I have seldom seen the Brazilian Merganser walking much when ashore. When swimming or at rest in the water its body is only slightly submerged; this is a field-mark distinguishing the merganser from the Brazilian Cormorant (*Phalacrocorax brasilianus*) which is also found along these rivers and streams. The Brazilian Merganser sinks lower in the water before diving or when alarmed.

The Brazilian Merganser is an accomplished diver. The following account refers to the diving activities of two pairs of mergansers observed in August, 1951, on the Urugua-i River. The ducks were often observed feeding in the shallow waters at the upper end of a rapids where the swift current breaks against some emergent stones. Sometimes while one of the mergansers was feeding, the others perched on the rocks; at other times they were all in the water diving for food. Because some mating behavior occurred it was often difficult to tell whether the birds were feeding or playing. When diving, they leapt up before the plunge and disappeared below the surface for several seconds, emerging afterwards in nearly the same place.

Observations of the diving activities of the Brazilian Merganser were also made from the blind at the site of the nest discovered at "kilometer 30" of the Urugua-i River in 1954. On August 28, while the female was on the nest, the male guarding the river in front of the nest-site began to feed in the shallow waters near some emergent stones that he used for perches. The floating position of the body, with the tail up as when resting, was suddenly changed before diving: the body was somewhat lowered in the water, the tail fanned-out and dragging on the surface; then the bird would submerge quietly. During dives the bird remained under water for periods of 15 to 20 seconds, swimming swiftly with neck straightened and wings close to the body. I observed no wing movements while the bird was under water.

Flight.—The Brazilian Merganser flies close to the surface of the water and always follows the river's course. If during flight it encounters a potentially dangerous obstacle (such as a canoe) the merganser will increase altitude to as much as 15 or 20 meters, or deviate to one side. The flight is swift, wavering, and noiseless; the wings are moved continuously and rapidly. While on the wing the birds hold their necks stiffly outstretched, and the whole body has an elongated, slender shape.

Voice.—The Brazilian Merganser is an exceedingly silent bird, although occasionally a simple *queeek* may be heard while in flight. In the breeding season it becomes quite noisy when defending its nest or young.

Food.—From the examination of 11 stomachs and gullets it is clear that the Brazilian Merganser feeds primarily on live fish captured underwater. Occasionally it may take aquatic insects and snails.

Nine stomachs and gullets contained the remains of digested fish (usually scales and small bones) or entire specimens. Eighty per cent of the contents of one full stomach and gullet consisted of entire or partially digested remains of the larvae of a large dobson fly (*Corydalis*) and also a few (0.8 per cent) snail shells. No trace of vegetable food was found in the digestive tract of any specimen; a certain amount of grit and gravel was often present.

Brazilian Mergansers are quite voracious. Whole fish found in the gullet varied from 6 to 19 cm. long. In all cases where entire or half-digested fishes were found, they had been swallowed head-first. Digestion begins at the head of the fish as it enters the stomach. The fish is digested by stages; sometimes the undigested tail-half of one is found in the gullet together with an entire, recently-swallowed fish.

The contents of eleven stomachs and gullets of Brazilian Merganser. (The numbers of the bird skins are added to avoid repeating collecting data in the list of specimens given before.)

No. 31328. May 29, 1948. Killed at 9 A.M. Gullet and stomach empty. Only a small amount of grit and gravel found in stomach.

No. 31329. July 20, 1948. Killed at 5:15 P.M. Stomach contents: 25 cc., with 88 per cent insects (larvae of a dobson fly, *Corydalis* sp.) 2.5 per cent of fish remains, and 0.2 per cent of snail shells. Gullet contents: 20 cc., composed of 70 per cent of entire specimens of *Corydalis* and 30 per cent of fish remains.

No. 31330. July 22, 1948. Killed at 6 A.M. Stomach with 2 cc. of fish remains.

No. 31331. July 22, 1948. Killed at 12 Noon. Stomach with 14 cc. of digested fish remains.

No. 31332. July 22, 1948. Killed at 12 Noon. Stomach with 9 cc. of fish remains.

No. 31333. July 28, 1948. Killed at 2 P.M. Stomach with 12 cc. of fish remains.

No. 31760. September 12, 1949. Killed at 10 A.M. Gullet content: One entire small "Mojarra" (*Characinidae*), 6 cm. long.

No. 32367. March 24, 1950. Killed at 3 P.M. Stomach: 20 cc. of digested fish. Gullet: one entire half of a Cichlid fish, whose head had already been digested in the stomach.

No. 32368. March 24, 1950. Killed at 3 P.M. Stomach: 10 cc. of fish remains. Gullet: One complete "Cat-fish" (*Pimelodidae*), 19 cm. long.

No. 33245. August 16, 1951. Killed at 4 P.M. Stomach: 9 cc. of fish remains.

No. 33246. August 16, 1951. Killed at 4 P.M. Stomach: 12 cc. of fish remains including an entire half of a small Characinid. Gullet: an entire "Virolito," *Parodon, (affinis?)*; [Family *Hemiodontidae*], 11 cm. long.

Display.—Giai (1950: 159) says the mating displays of the Brazilian Merganser begin in June; I have seen what I suppose were mating displays in August. Two pairs of Brazilian Mergansers which I found in the Urugua-i River in August, 1951, were undoubtedly at the beginning of a breeding period. Several of their movements appeared to be courtship attitudes. One bird (probably a female) was sometimes suddenly chased by another; without leaving the water they would move around in circles, paddling strongly with their wings. This display would last anywhere from a few seconds to several minutes. When one pair began its circular "display" the other pair would sometimes follow suit in a noisy entanglement of wings and splashed water. A few minutes later they would perch on stones, shaking the water from their bodies and preening.

BREEDING HABITS

The breeding habits of the Brazilian Merganser remained a mystery until the first nest was discovered in 1954 along the Arroyo Urugua-i, Misiones. On August 28, 1951, I found flightless young at "kilometer 10" of the Urugua-i River. In 1953, I was informed by native hunters that a pair of mergansers with a brood of five newly-hatched young was found in that same locality on August 2. Giai (1950: 159) mentions downy young found on August 4, 1948. All this information suggests that incubation occurs in July and that the young are hatched during the first days of August.

In July, 1954, while searching for the Brazilian Merganser along the Urugua-i River, I failed to find nests because of an exceptionally rainy season which made thorough exploration along the river impossible. After our camp was established at "kilometer 30" I was informed by native hunters that downy young were found at "kilometer 10" in the first week of August. While exploring the Urugua-i River near our camp in August, a pair of mergansers with no young was located. After watching their movements for several days, I discovered their nest on August 24, when the female flew to it from the water. This pair of mergansers was apparently one month late in breeding according to all the previous information.

Nest.—The nest was located in the hollow limb of a live tree known locally as "Yvyrâ pŷtâ" (*Peltophorum dubium;* Family Leguminosae) at a height of about 25 meters above water level (Plate 18). The tree was growing on the shore, and the branch with the nest-hole, which faced the water, was visible from the river. The entrance hole was 35 by 15 centimeters and the nest-cavity was 3 meters deep. A great deal of fine, rotten wood was removed from the bottom of the

cavity after the young had left. No other material was found in the cavity except for some pieces of egg shell, which were of a light cream color.

Behavior of parents at nest.—I followed the movements of the mergansers for seven days from a blind built on the river shore under the tree in which the nest was located. Incubation was performed only by the female. While she was at the nest the male was always in the river; he spent most of his time perching on a group of stones emerging from the water in front of the nest site. While resting, he would lie on the stones with his head under one wing, apparently sleeping. At the slightest noise he would rise up and look around; on finding that everything was quiet, he would resume resting. At other times he would feed in the shallow water near the emergent stones.

The female came out of the nest to feed only once a day. Every morning between 8:30 and 9:00 A.M. she flew out of the nest to the river, giving a few loud calls. The male answered the calls while flying towards her; both then flew together to their feeding grounds along the rapids. They sometimes flew upstream and at other times downstream as the nest was located half way between two rapids. They never fed together in front of the nest. They stayed from an hour to an hour and a half on the feeding grounds. On returning to the nesting area they uttered loud cries before alighting on the water. Next they swam towards the stones (Plate 19), and after climbing on them, stayed there for about 10 or 20 minutes, drying their plumage. Leaving the stones, they swam towards the middle of the river and from there flew to the nest. The male always flew with the female to about three or four meters from the entrance of the nest; as the female went in, he flew back to the river. Once on the water, he uttered a long cry, sometimes two, looking towards the nest. The male passed the rest of the day near the nest.

On August 27, after both birds had returned from the feeding grounds and before the female had flown to the nest, they copulated. Having dried their feathers while perched on the stones, they returned to the water and began to bathe. Suddenly the female partially submerged herself—her head, neck, body, and tail forming a straight line at water level. She remained motionless in that position for a few seconds until the male mounted her holding her short crest with his bill. When they copulated both birds were completely submerged. On completion of the mating act the female uttered a long cry. Both birds bathed, perched on the stones drying their plumage, and then the female flew to the nest.

The holding of the female's crest by the male during copulation

causes considerable wear; many of its feathers may be broken off near their bases so that some of the females appear crestless. At other times of the year the crest of the female is only slightly shorter than that of the male.

On August 28 and 29, I did not see the female leave the nest, although I was at the blind well before the usual feeding time. The male was alone on the river. On August 30 the female came out to feed, but the pair spent only half an hour on the feeding grounds. When they came back they seemed frightened; before the female went in they flew past in front of the nest twice giving loud cries. When the female went to the nest, the male uttered three long cries. That same afternoon the young left the nest. Unfortunately, not having been at the blind when this occurred, I failed to see how the young mergansers reached the water from the nest. The next day, August 31, four downy young were found on the river with their parents.

Young.—The four young mergansers showed great agility on the water when pursued. They ran very swiftly, hardly touching the surface of the water with their feet and continuously flapping their wings; they never dove.

The upper parts of the downy young Brazilian Merganser are black with three white patches: on the wing, side of back, and side of rump. The under parts are pure white. A white stripe extends from the lore to below the eye. There is a white spot in front of the eye. The iris is gray; the bill black; legs and feet drab gray; webs black (Plate 20).

ENEMIES

While watching the adult Brazilian Mergansers from a blind near the nest, I have seen them frightened by any large bird flying across the river or by the slightest sound of the flapping of wings nearby. They seem always to be expecting some enemy from the air. On one occasion both birds were perched on the stones in front of my blind, drying their plumage, when the sudden flapping of wings by a Common Urraca Jay (*Cyanocorax chrysops*) frightened them so greatly that they each uttered a loud cry and dove into the water.

Apparently the most dangerous enemy of the Brazilian Merganser in Misiones is the Black-and-White Crested Eagle (*Spizastur melanoleucus*). On September 1, 1954, we found our pair of Brazilian Mergansers with the young hidden on the quiet waters under the thicket growing on the river shore. Above them, watching from a dead tree, was a Black-and-White Crested Eagle, undoubtedly waiting for the mergansers to come out into the open water. Black-and-White

Crested Eagles were found by us many times along the Urugua-i River.

Giai (1951: 256) reports the Black-and-White Crested Eagle preying upon the mergansers.

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SUMMARY

The Brazilian Merganser was rediscovered in Misiones (Argentina) in 1947; up to that time the species had been considered close to extinction.

The available locality records indicate that the Brazilian Merganser is restricted to southeastern Brazil and the neighboring regions of Paraguay and Argentina.

In Misiones the Brazilian Merganser is not rare but has been found only along the small rivers and streams that flow from the highlands in the interior of the province into the Alto Paraná, which is a tributary of the La Plata River. The Brazilian Merganser lives in the wildest parts of these small rivers and has never been found on the Alto Paraná itself.

Brazilian Mergansers are sedentary birds and probably spend their entire lives along a small part of one river. The species is nonmigratory and the pairs appear to stay together throughout the year.

The feeding grounds of the Brazilian Merganser are along the rapids. They dive for their food which consists mainly of fish up to 19 centimeters in length.

The breeding season begins in June. Incubation occurs in July and August. Downy young have been found in August. The first and only nest discovered was in the hollow limb of a tree and was 25 meters above the water level. Four black and white downy young left the nest on August 30, 1954.

Probably the most dangerous enemy of the Brazilian Merganser in Misiones is the Black-and-White Crested Eagle (*Spizastur melanoleucus*).

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Argentine Museum of Natural Sciences, Buenos Aires, July, 1955.

THE CAPE SABLE SEASIDE SPARROW: ITS FORMER AND PRESENT DISTRIBUTION

BY LOUIS A. STIMSON

THE Cape Sable Seaside Sparrow, *Ammospiza mirabilis* (Howell), was first discovered on the Cape Sable salt prairie by Arthur H. Howell on February 18, 1918. Howell (1919) gave a complete description of the bird and stated his reasons for believing that it should be given specific rank. He later (1932) gave the history of the bird as known up to that time. Although giving the range as, "an area about six miles in length and not more than half a mile in breadth" on the coastal prairie near Cape Sable, Howell mentioned Nicholson's (1928) finding of a singing male about six miles northwest of Pinecrest and stated that "further search in this region may show that the species has a wider range than our present knowledge indicates." At the same time he stated that "there is no country suitable for seaside sparrows on either coast for a long distance northward." This last statement was born of ignorance of the real conditions along the southwest coast of Florida, perhaps excusable at the time. The two statements are entirely contradictory, but in the light of present knowledge, the former was a true prediction. Later investigations on the Cape showed that the sparrows there ranged from Flamingo to behind Northwest Cape, Semple (1936) and Samuel A. Grimes (oral). See map.

Sutton (in Holt and Sutton, 1926) described the labor involved in finding this species and published an excellent colored plate of the bird. However, observations in the field with 7× binoculars at a later measured distance of 36 feet did not disclose the amount of black in the sub-orbital region displayed on the plate but did show the area as described by Howell (1919). Any ornithologist, or bird watcher, who must now rely on sight could do no better than to study both Howell's 1919 description and Sutton's plate before attempting to make a field identification.

Nicholson (1928) recorded finding a singing male of this species in an open grassy savannah about six miles *northwest* of Pinecrest. Although not doubting Nicholson's seeing of the bird at some point, the location as given was so fantastic as a habitat for a Seaside Sparrow that no one actually familiar with the Pinecrest area could give the location much credence. Pinecrest, in 1928, was a small village located on the southernmost segment of the Loop Road (originally surveyed to be the Tamiami Trail). The location is 20, or more, miles from the nearest point on the Gulf of Mexico. Any point northwest of Pinecrest would be, moreover, in the very heart of the cypress

(*Taxodium distichum*) swamps covering the area. Nicholson (1938) again mentioned this place, writing that in 1932, with Joseph C. Howell, Jr., the sparrows had again been found there; but that in 1937, with Arthur H. Howell, John B. Semple, and others, no sparrows could be found,—"in the savannah 7 miles north" (sic) "of Pinecrest." Correspondence between the author and Nicholson and J. C. Howell, Jr., in 1952 established the fact that the actual location was on a savannah extending out towards the coast from the Lostmans Pine Islands area *southwest* of Pinecrest, the confusion apparently having been due to the windings of the Loop Road and failure to study a map of the area. In Sprunt (1954) this location was more correctly given by the author but lack of space prevented any explanation of the change from Howell (1932).

During the years from 1918 to 1935 many specimens of this bird were taken on Cape Sable for various museum and private collections. Nests, eggs, and young were found; and some determinations of the food habits were made from stomach analysis, see Howell (1932) or Sprunt (1954). It would be interesting to know how many people actually saw the live bird during that period.

On September 2, 1935, the most violent storm on record in the western hemisphere struck the Keys and the Cape Sable area (Tannehill, 1945, and the United States Weather Bureau, 1935). The center of the storm passed over Long Key at 9:20 P.M., and traveling at ten miles per hour, it must have reached the vicinity of Cape Sable about midnight. The center of the storm passed Cape Sable at an undetermined distance at sea, but supposedly within a few miles. At Long Key the center was preceded by a hurricane wave of 15 to 20 feet and accompanied by winds of 150 to 200 miles per hour with gusts exceeding 200 m.p.h. "Reports agreed in the description of the great rapidity with which the rise of the sea came in from the southern side of the Keys as a 'wave of water' or a 'high wall'." Cape Sable was buried under a wave of eight feet or more. Members of the Roberts family then living at Flamingo had received radio warning and started to walk out just prior to the arrival of the hurricane wave. On December 6, 1935, the elder Mrs. Roberts told me that when they reached the road along the bank of the Flamingo canal the water in the canal was very low, but within a few minutes the water was up to their armpits; and the only thing which saved their lives was the recent elevation, of about two feet, of the road along the canal bank. Going westward from Flamingo that same day I found a line of bleached seaweed festooned for long distances in the trees about eight feet or more above the normal high water mark.

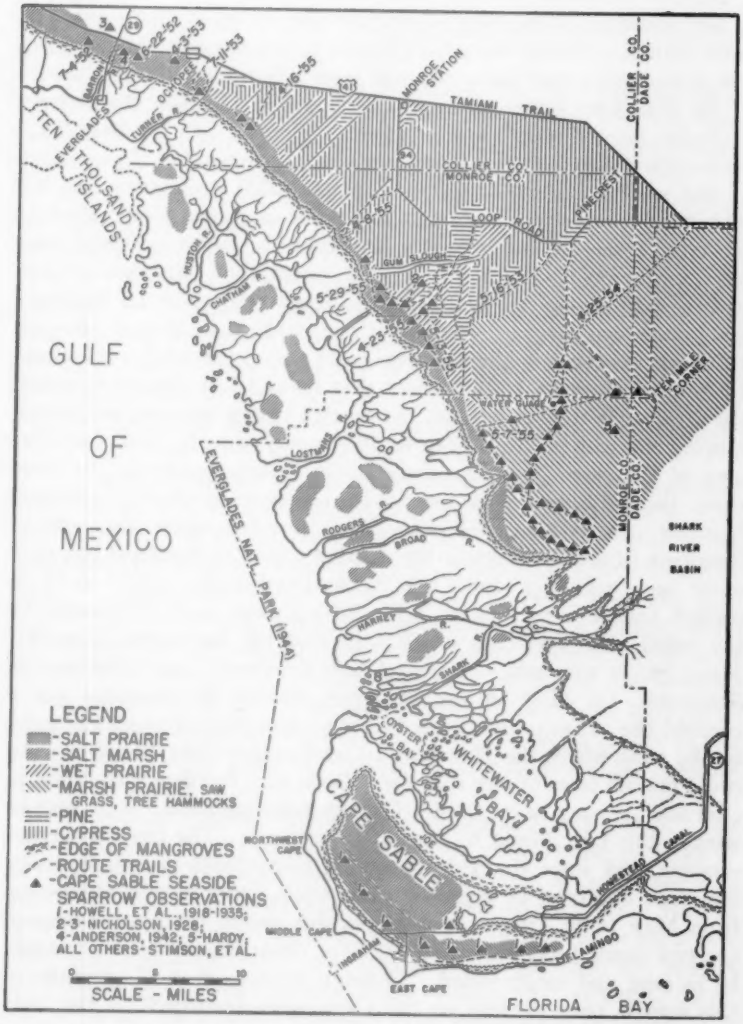

FIGURE 1. Map of the southwestern tip of Florida, showing the range of the Cape Sable Seaside Sparrow.

It seems incredible that any small sparrow could have escaped alive. If any sparrow did manage to get into the air when that eight foot wave struck, it would have been blown to sea towards the center of the storm and would have dropped from exhaustion into the waters of the Gulf long before the storm again crossed land in the vicinity of Cedar Keys, far up the west coast of Florida. To my knowledge no reports have ever come from that part of the coast of the presence of this species since the storm. Semple (1936) does state that the bird was in its usual haunts on Cape Sable in April, 1936. That he must have been mistaken in his identification seems apparent from later information. Nicholson (1938) states that Mr. Semple was with a party consisting of Arthur H. Howell, Thomas D. Burleigh, and others on May 19, 1937, at Cape Sable, and though they all searched areas where they had formerly found the bird, none could be found. Burleigh (1939) states that he and Mr. Semple searched the area on December 8, 1938, but no sign of any sparrow was found. During the winters from 1946 to 1950 many reports came from the area of the presence of the Cape Sable Seaside Sparrow. In most cases the bird seen was simply the common-in-winter Savannah Sparrow (*Passerculus sandwichensis*). In other cases, Sharp-tailed Sparrows (*Ammospiza caudacuta*) having a similar flight pattern may have been mistaken for Cape Sable Seaside Sparrows. In fact scratch feed was put out near the fishing camp and boat livery on the canal near Flamingo which attracted the Savannah Sparrows. Many people were told, or believed, that they were Cape Sable Seaside Sparrows. On May 14 and 29, 1949, Robert Woodmansee and I combed the entire prairie from Flamingo to a point about 11½ miles to the west where the Homestead Canal enters Lake Ingraham and could find no trace of any sparrow. Both were familiar with *A. mirabilis* and its song in its Collier County breeding area. If present in winter, this bird would be present in summer. The irrefutable fact remains that since the 1935 storm no Cape Sable Seaside Sparrow has been observed or reported from Cape Sable during the period from May 15 to August 1; during which period no other species of sparrow would be present, and the Cape Sable Seaside Sparrow would be in song and easily found. It seems obvious that all sparrows of this species then present on the Cape were destroyed by the 1935 storm.

Many began to feel that the species had followed the Great Auk into oblivion. However, such was not the case. Nicholson's find in 1928, and 1932, preceded the 1935 storm. The error in location as published was unfortunate. However, we now know that the

sparrows were in the presently known range long before the hurricane. They were not blown up there by the storm. It is my belief that they have existed there since their evolution.

The new locations given later in this article were determined by the view of a singing male during the breeding season, and two specimens were taken near Ochopee and were sent to the National Museum for the Fish and Wildlife Service collection, see Stimson (1953).

Anderson (1942) and Stimson (1944 and 1948) record a colony in southern Collier County. The four men who knew of this location felt that it should not be divulged exactly until a definite establishment of more colonies had been made. It can now be told that the spot was in the marsh close to the corner of the Tamiami Trail and the road running north to La Belle from Everglades (city). In Sprunt (1954) I listed two other locations in the neighborhood, together with a location found in 1949 by Lamond Hardy southeast of Pinecrest. The two specimens taken in 1952 were obtained at the location about a mile east of the Anderson discovery point.

Nicholson has written me that in an old notebook for 1928, recently found by his wife, he had recorded hearing several *A. mirabilis* songs on the north side of the Tamiami Trail about a mile west of the Everglades crossroad. Both alone and in company with William G. Atwater, I have searched at several points westward from the most westerly known colony (about two miles west of that crossroad) as far even as the small marsh near Shell Island south of Naples, but no more colonies have been found in that direction. The search was confined to the southerly side of the Tamiami Trail. West of the Everglades crossroad there are several areas of salt and transition marsh on the northerly side of the Trail, and further search may reveal the presence of colonies there.

Soon after its publication, I secured a copy of Davis (1943). The vegetation map accompanying this bulletin showed the presence of salt marsh lying to the landward of the mangrove fringe all the way from Shell Island, south of Naples, to the Shark River Basin. Having known of the existence of the Cape Sable Seaside Sparrow in the accessible marsh near Ochopee and Everglades, I felt that the species probably existed in many suitable places all along that southwest coast, and so stated in Stimson (1948). That supposition has now been proved true.

On April 3, 1953, I found *A. mirabilis* in the salt marsh amongst an extensive growth of marshhay cordgrass (*Spartina patens*) about a mile and a half southwest of Ochopee and since have shown the species to many people at that point. On July 11, 1953, William G.

Atwater and I found the species in high Spartina grass west of, and close to, the Turner River near the edge of the mangrove fringe. On May 16, 1953, we walked the old oil well trail from the Loop Road about half a mile west of Pinecrest, continuing southwest through the cypress to one of the Lostmans Pine Islands group, but were turned back by high water on the open prairie beyond and lack of time, without finding any sparrows. On May 2, 1954, we attempted to get to the salt marsh in the vicinity of the headwaters of the Chatham River, starting from the curve on the Loop Road five miles south of Monroe Station, but owing to high water and soft ground, we were unable to get more than half way by noon and had to turn back.

On April 25, 1954, I was allowed by the Everglades National Park authorities to accompany Rangers Erwin Winte and Fred Devenport on a trip by caterpillar tractor swamp-buggy to a water gauge just inside the park boundary about four and a half miles west of the Monroe-Dade County Line. From the saw grass (*Mariscus*) some two miles or more north of the water gauge a sparrow was flushed, which, as it flew away with the sun on its back, showed the characteristic greenish cast of *A. mirabilis*. At the water gauge we heard the song of *A. mirabilis* two or three times in the distance, but were too busy extricating the bogged-down machine to go and check the birds. This point is about four miles from the spot where Hardy found the birds in 1949, and amazingly both were in fresh water saw grass.

In years of normal rainfall this whole southwest coast marsh area during April, May, and later is accessible only by air-boat, or perhaps helicopter. Neither is hardly the type of conveyance from which to seek a small bird. The first four and a half months of 1955 proved to be the driest similar period since 1928, according to the Miami Weather Bureau. Up to 5:00 P.M. on May 15, 1955, the rainfall for the period had been only 3.99 inches, as compared to 4.05 inches through May 15, 1928. Only a 0.15-inch fall of rain during the evening of May 15 kept 1955 from breaking the all time record. The whole region had practically dried up. It became possible to walk anywhere northwest of the Shark River Basin out to the mangrove fringe completely dry-shod. A swamp-buggy could go easily almost anywhere. I attempted to take all possible advantage of this drought condition.

On April 8, 1955, I walked from the Loop Road, five miles south of Monroe Station, southwesterly to the mangrove fringe near the headwaters of the Chatham River. The prairie at that point was quite narrow, and there were only a few small patches of Spartina

grass. Being there from 11:00 A.M. to 1:00 P.M. was not the best time of day to find Seaside Sparrows in song. The day was bright and hot, and if any sparrows had been present they undoubtedly would have kept down out of sight. None were found. The area did not look very favorable as a habitat for them.

On April 16, 1955, I found *A. mirabilis* in tall Spartina grass near the southerly end of the Barnes Strand (cypress) about eight miles west of Monroe Station and three and a half miles south of the Tamiami Trail. The plan had been to walk completely around the Barnes Strand, but the Spartina grass became very high and dense, and extremely hard to force one's way through, so the plan was given up. The back track via swamp-buggy trail held out far more inducements. In all, one Cape Sable Seaside Sparrow was seen singing, several more were heard singing near at hand, and several were heard close by in the grass giving the "zup-zup" call note described in Sprunt (1954). Several were flushed which showed the greenish cast on the nape as they flew off away from the sun. Savannah, Sharp-tailed, and Swamp Sparrows (*Melospiza georgiana*) were also seen.

On April 23, 1955, I walked from the old saw mill site, about six miles west of Pinecrest on the Loop Road, down an old lumbering road to Gum Slough, where only a cupful of water remained in a wheel rut. From there a swamp-buggy trail was followed through the Lostmans Pine Islands and extensive prairie to the edge of the mangrove fringe. *A. mirabilis* were found both in the salt marsh and back up in the prairie-bay between two of the pine islands where the cover was saw grass and other grasses. This prairie-bay was probably within a mile or so of the supposed location of the 1928 Nicholson find. With side forages, the round trip for the day covered about 18 miles. Three hunter's cabins were found in the pine islands, one about four miles from the Loop Road. On May 12 and again on May 28 I packed in food, water, and blanket roll for two nights of camping on each trip at the cabin nearest the Loop Road. On May 13 a route was followed south from camp to the open marsh, thence southeasterly to the Everglades National Park boundary about a mile east of the mangrove fringe. The day was bright and hot. *A. mirabilis* were found at three points early in the morning. At 7:45 A.M. a bird was seen at close view swinging and singing on top of a tall spear of grass. At. 8:03 A.M., near the edge of a slough carpeted with purslane (*Sesuvium portulacastrum*) and bordered by an extensive growth of Spartina grass, three birds were seen perched in the tops of the grass as they sang. At 9:20 A.M. one Cape Sable Seaside Sparrow was heard singing in the Spartina grass to the south.

Thereafter no more Seaside Sparrows were seen during the day, and no other species of sparrows were seen that day. The mangroves extended up into the marsh, or prairie, along the sloughs (apparently the headwater creeks of the Lostmans River) leaving large prairie-bays deep down towards the coast. I walked on a line to miss the points of the mangrove extensions and may have missed many good habitat locations of the sparrows. Lunch was eaten at the Park boundary. Returning in the heat of the early afternoon, a direct line was taken to the nearest point of pines about three miles away, thence through the pines and intervening open prairie-bays back to camp for a day's trip of about 17 miles. On May 29 a route was taken westward from camp through the pine island to the open prairie-bay bordered on the west by a cypress strand, apparently the spot where Nicholson found the bird in 1928 and described to me in a letter from Mr. J. C. Howell, Jr. No sparrows were found in this prairie-bay (grassy savannah), but about two miles nearer the mangrove fringe and within a half mile of the first sight of purslane, *A. mirabilis* were heard singing in an area of Spartina grass, one being approached to within a later measured (paced) distance of less than 36 feet. Viewed through 7× binoculars the bird might as well have been in the hand. Altogether 12 Cape Sable Seaside Sparrows were seen and heard singing along the transition marsh, containing in places some saw grass, as far northwest as the wide slough (then dry but apparently a small lake in wet weather) into which Gum Slough empties. More about this spot later. The round trip distance for the day from 6:30 A.M. to 2:30 P.M. was about 15 miles.

On May 7, 1955, Charles M. Brookfield, his brother Richard, William G. Atwater and I engaged Don Poppenhager to take us by swamp-buggy, with permit from the Everglades National Park authorities, down to the headwater creek of the Broad River on the edge of the Shark River Basin. Starting at Pinecrest our course took us within about three-eighths of a mile from the water gauge visited in 1954. At a point about two miles north of the park boundary we flushed a light-colored sparrow. The buggy was stopped and I went on foot to check the bird. It had flown to a perch on a spear of saw grass in plain view, and all heard the song of the Cape Sable Seaside Sparrow. Again at a point about half a mile from the last mangrove clump at the head of Broad River, I checked a bird on foot, and another bird close by sang the *A. mirabilis* song. Having carefully checked their presence in the area, we counted during the day from the buggy 56 light colored sparrows which, as they flew away from the sun, showed the typical greenish nape of the Cape Sable Seaside

Sparrow. Many others flying into the sun were not counted. Also during the day about 20 Swamp Sparrows and 50 Grasshopper Sparrows (*Ammodramus savannarum*) were observed. Atwater and I walked over to the last mangrove clump at Broad River and found water which was entirely sweet to the taste. Atwater was surprised to find pond apple (*Annona glabra*), wax myrtle (*Myrica cerifera*), and cattails (*Typha latifolia*) in association with red mangrove (*Rhizophora mangle*). Along the slough *Sesuvium* was found, indicating the presence of salt underneath, even though the surface water was fresh. From Broad River the swamp-buggy went northwestward across the head of Rodgers River, crossing in water. Far back inland Don had driven the buggy up to the edge of an alligator hole, perhaps 30 feet in diameter, still having water. There were only three places at which water was found during the entire day. However, approaching Broad River the surface was damp and the buggy was inclined to bog down. When it did so we all got off and walked it up out of the hole, Don having left it in low gear. (It was the same swamp-buggy portrayed in the National Geographic Magazine a few years ago in connection with an article describing a trip from Lake Okeechobee across the everglades to the southwest coast. The buggy has two rear axles, each with two large wheels on each side, the tires on the leading axle being equipped with tire chains. The two axles are hooked up in a tandem drive with two transmission boxes of three gears each.) Some distance further up the coast, probably within two miles of the point where I lunched on May 13, we were buzzed by an airplane. A note was dropped requesting that Don go to a point about a mile south of "ten-mile corner" where smoke had been seen rising from two hammocks, check on the fire and report to Ranger Winte on our return. Waving the requested signal of "something white" we spent the rest of the afternoon on that endeavor, noting *A. mirabilis* at three points, two of them again north of the park boundary. See map.

Dr. Sloight, of the Department of Geology at the University of Miami, stated in a public lecture at a meeting of the Tropical Audubon Society that in the last sixty years there has been a five-inch rise in sea level along the southwest coast of Florida. Davis (1943) states that the red mangrove will live in fresh water. Indications point to the fact that red mangrove seedlings float up on the fresh water marshes, take root and grow slowly until the rising salt water reaches them, after which they make more extensive growth and increase in numbers. Nicholson (1950) comments on the disappearance of the Smyrna Seaside Sparrow (*A. m. pelonota*) from a marsh

near New Smyrna owing to mangroves having taken over the entire marsh. On July 11, 1952, Mr. R. J. Longstreet pointed out this spot to me. Twelve years ago the marsh at the Anderson location was free of mangroves, but while passing there on May 21, 1955, I noted that much of the marsh, even up close to the Tamiami Trail, was peppered with seedling red mangroves. In 1950 I noted a tidal action in that marsh right up to the bank of the Trail; the marsh being dry in the morning, and, without rain, being covered by an inch of water in the afternoon. In 1955 a distinct tidal effect was noted in the Tamiami Trail canal about nine miles easterly of the Barron River canal. In rainy seasons the marshes at Ochopee (and probably all along the southwest coast) are covered with fresh water on the surface, but such dominant plants as *Sesuvium portulacastrum*, *Juncus roemerianus*, and *Spartina patens* indicate the presence of salt underneath.

From where Gum Slough exits onto the prairie northwestward to near the headwaters of the Chatham River, the red mangroves have encroached in many places right up to the cypress strands, and most of the existing prairie is broken up by scattered clumps of mangroves. Apparently some cypress has been killed by the recent five-inch rise in sea level, evidenced by the presence of dead trees standing out on the prairie in front of the present strands. The effect of this rise in sea-level seems to be shown very clearly at the mouth of Gum Slough on the north side. The cypress strand comes down along Gum Slough to a point on the edge of the prairie where it turns northwestward. About 200 feet out in the prairie there stands a hardwood hammock, containing also some cabbage palms (*Sabal palmetto*) and some cypress. The whole hammock is surrounded by a fringe of red mangroves. At the point itself there are red mangroves right up against the cypress. The slough from the point outward is carpeted with purslane. Starting at the point a wedge of tall Spartina grass widens out towards the northwest. Immediately between the Spartina grass and the cypress there is a wedge of tall saw grass which also widens out towards the northwest. Towards the southwest the mangrove clumps increase in numbers, size, and height towards the coast. Water marks on the mangrove roots indicate that in years of normal rainfall this part of the prairie would be almost a river, perhaps fresh on the surface and salt underneath. It looks very much as though a hiatus has built up, or is building up, separating the Seaside Sparrow colonies southeast of Gum Slough from the colonies found in normal *Spartina* habitat northwest to the Ochopee marshes. The hiatus apparently extends from the Gum Slough entrance to

northwest of the headwaters of the Huston River. With the destruction of the salt marsh and the adjoining wet prairie, the dense strands of cypress must have forced the Seaside Sparrows to have moved to the colonies on either side or to have perished.

In the region between Broad River and Rodgers River, the mangroves apparently have destroyed much of the original salt marsh, and the Seaside Sparrows have adapted themselves to a life in the adjoining area, designated by Davis (1943) as everglades marsh prairie. The fact that the growth of saw grass is short and sparse in this region may possibly indicate the encroachment of salt underneath the surface, but since the condition exists at least as far inland as the Tamiami Trail it is probably the result of other factors. Griscom (1944) states that no bird hugs salt water more closely than the Seaside Sparrow and, "In a whole century the individuals that have been found 5 miles from salt water are few and far between and in most cases casual waifs." Yet here in southern Florida we have Cape Sable Seaside Sparrows living amongst saw grass and other fresh water grasses. On that May 7, 1955, trip someone offered the witticism that had the bird been discovered in this area instead of on Cape Sable it might have been named the Saw Grass Sparrow, rather than the Cape Sable Seaside Sparrow. The 1954 and 1955 location north of the water gauge is about 6½ miles from the mangrove fringe. The Hardy location is at least 7 miles from the mangrove fringe. The Cape Sable Seaside Sparrows last seen on May 7, 1955, were between 9 and 10 miles from the nearest point on the mangrove fringe. Besides these definite points there have been unconfirmed reports of this sparrow much further inland. In other words there is an area of at least 70 square miles, with more available, where the Seaside Sparrow apparently lives in a fresh water habitat. There appears to be a greater concentration of Seaside Sparrows in this area than in the normal *Spartina patens* habitats further up the coast. The final ecological relationships of this phenomenon will have to be worked out by a botanist-ornithologist, and someone with more financial or institutional backing than have been at my disposal.

Griscom (1944) states that *A. nigrescens* has two claims to specific distinctness but that *A. mirabilis* has no real claim to specific distinctness and is probably only an extreme development of the light phase of *A. marilima*. Griscom goes on to say that the pure white underparts of *mirabilis* actually deprive *nigrescens* of one of its absolute characters. The A.O.U. Committee on Nomenclature and Classification of North American Birds does not recognize this viewpoint, and according to its chairman, Dr. Alexander Wetmore, has decided to

treat both as full species in the forthcoming new A.O.U. Check-list. However, in the field I have been impressed by the great similarity of action and song of these two so differently colored birds. Both birds give two or more preliminary guttural clicks before the normal song. These clicks can be heard only if one is within about fifty feet of the singing bird. The songs seem to vary only in the more buzzing quality and strength of *nigrescens*.

It is perhaps idle to theorize on the way in which this sparrow reached Cape Sable. The following ideas are based in part on the geological history of the Florida peninsula. Certainly there were no sparrows anywhere in Florida during the first (Aftonian), or second (Yarmouth) interglacial stages, when according to Cooke (1939) the sea level stood at plus 270 feet and plus 215 feet, respectively. It may have been possible for Seaside Sparrows, if any were then in existence, to have gained a footing on Floridian shores during subsequent glacial stages of the Pleistocene Epoch. Beecher (1955) states,—"The Cape Sable seaside sparrow may have been isolated when the lower third of Florida was inundated by the post glacial rise in sea level." According to Cooke (1939) this inundation occurred during the post-Iowan interglacial stage of Wisconsin time. Surely no sparrows could have existed in southern Florida during that inundation when the Pamlico Sea stood at plus 25 feet. During the last part of the Wisconsin glacial era when the sea level dropped to minus 25 feet or more, it might have been possible (and probably was) for the ancestral sparrow to populate the west shoreline of Florida then lying several miles out in what is now the Gulf of Mexico. Retreating before the inexorable rise of the sea during the melting of the final glacier of late Wisconsin time, the sparrows caught in the flooding of Tampa Bay, Charlotte Harbor, and estuary of the Caloosahatchee were destroyed, leaving the sparrows north of Tampa Bay to develop the characteristics of the Scott's Seaside Sparrow (*A. m. peninsulae*), and the sparrows south of Naples to develop the characteristics of the Cape Sable Seaside Sparrow (*A. mirabilis*).

To the seaward of the inland bays along the southwest coast there are many areas of salt marsh scattered through the mangrove swamp, pond, and stream region. On July 25, 1952, with Joseph C. Moore, William G. Atwater, and William B. Robertson, I investigated several of these marshes along the Joe River and upper Shark River (Tarpon Bay). Salt-killed saw grass was present in some, and dominant black rush (*Juncus roemerianus*) in all, but no sparrows were found. These marshes are undoubtedly remnants of a salt marsh that at some past time extended all along this coast from near Naples to Cape

Sable. Only in recognizing the presence of such a continuous marsh does it seem possible to explain the former presence of the Cape Sable Seaside Sparrow on Cape Sable.

Davis (1943) states that the deep peat deposits along the southwest coast of Florida in the region between Shark River and Barron River are now interpreted as indicating a rise of sea level of 7 to 10 feet in recent geological times. Mr. Robert Ginsburg, then with the Marine Laboratory of the University of Miami, told me that in 1953 he took a core of peat from 75 to 101 inches deep in Florida Bay near Big Crane Key on which a Carbon 14 dating was made by the U. S. Geological Survey showing an age of 3300, plus or minus 240, years. It is evident that the 7- to 10-foot rise in sea level mentioned by Davis (1943) has occurred within the last 3000 to 3500 years. This rise of 7 feet or more would have flooded the present Shark River Delta, Oyster Bay, and Whitewater Bay region, where the present depth of water except for actual stream beds is now 4 or 5 feet, as shown by the U. S. Coast and Geodetic Survey map No. 598. The Cape Sable Seaside Sparrow had apparently reached its present stage of development prior to that flooding, or some 3000 years ago, since the specimens taken near Ochopee in 1952 were identical with specimens taken on Cape Sable in 1918 and following years. When that flooding occurred the Sparrows on Cape Sable were separated from the sparrows to the northwestward of the Shark River Basin. The present hiatus of water and mangrove swamp in the Shark River-Whitewater Bay region has prevented the sparrows from again spreading back to Cape Sable following the 1935 storm and will probably continue to prevent their doing so as long as present ecological conditions exist.

The map herewith shows approximately all points of observation of the Cape Sable Seaside Sparrow. At present the species ranges in the salt marshes lying to landward of the mangrove fringe along the southwest coast of Florida from northwest of Everglades (city) to near the headwaters of the Huston River; and in salt marsh and fresh water marsh prairie from the mouth of Gum Slough to the Shark River Basin. The Ochopee marshes are now the most accessible location for anyone wishing to see this interesting species.

I wish to acknowledge my indebtedness to Mr. Daniel B. Beard and Mr. Joseph C. Moore, superintendent and biologist, respectively, of the Everglades National Park, for their aid and cooperation in making several trips within the park possible; to Mr. William G. Atwater and Mr. Charles M. Brookfield for their aid and companionship on several investigating trips; and to Mr. Donald J. Nicholson and Mr. Joseph C. Howell, Jr. for cooperation in establishing the approximate location of their 1928 and 1932 site.

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P. O. Box 3303, Miami 21, Florida, July 15, 1955.

A COMPARATIVE STUDY OF "ADVERTISING SONG" IN THE *HYLOCICHLA* THRUSHES

BY ROBERT CARRINGTON STEIN

It has recently become possible to describe the sound patterns of animals objectively because of the development of recording and sound spectrographic analysis. Bird sounds can now be recorded on magnetic tape with light-weight portable equipment, with a self-contained power supply, operated by one man.

The early method of analysis, microscopic measurement of sound film tracks (Brand, 1938) has been superseded by the sound spectrograph. The application of this latter method to bird sound analysis was first suggested by Koenig *et al.* (1946) and was restated by Bailey (1950). For a recent description of the method see also Borror and Reese (1953). The following study explores further the use of the sound spectrograph for the comparison and description of the vocal utterances of the five species of *Hylocichla*, all found in eastern North America.

The spectrograms show the actual distribution of frequency in time for an individual pattern, in this case the apparently complete "advertising song," *sensu* Lack (1943), which functions to attract females and repel males of the same species when uttered by a territorial male. The term "sound pattern" has been applied to the generalized pattern derived from all the "individual patterns" of a given type analyzed. It can also be applied to any discrete vocal utterance, such as call note, alarm note, "advertising song," etc.

Sound spectrograms of the "advertising song" patterns of several individuals of each of the five species of *Hylocichla* were made for measurement and visual comparison. These analyses are from recordings made in widespread localities, although often more than one recording of a species, or of more than one species, were made at the same locality. The recordings studied were either field recordings in the collection at Cornell University or disc recordings published by Kellogg and Allen (1941, 1955), J. and N. Stillwell (1953), and Gunn (1954).

The descriptions of the sound patterns for each of the five species follow:

Wood Thrush (*Hylocichla mustelina*).—The following recordings were used in the analyses, with the number of individual patterns of "advertising song" analyzed indicated in parentheses:

June 24, 1948, Mt. Pisgah, Saranac Lake, New York (7)
June 28, 1951, Cornell University, Ithaca, New York (12)

June 18, 1952, Ithaca, New York (9)
May 16, 1951, Ithaca, New York (13)
June 5, 1953, Swallow Falls State Park, Maryland (8)

(recorded by J. and N. Stillwell)

The sound pattern of the Wood Thrush can be divided into three sections, major divisions distinct as to frequency or complexity. The first is a series of introductory notes of lower sound intensity than the middle section. There are from two to four individual notes (average three) about 0.1 second apart. Two variations, illustrated in Plate 21, Figures 1-A and 1-B, were observed.

The middle section is loudest and is the part by which people usually recognize the sound pattern of the species. In the 49 individual patterns of the five birds studied, 21 different phrases, groups of notes which are observed as a unit, were noted. The variations were found both within an individual series of one bird and between those of different birds. Some individual patterns included two phrases, the second being more complex, as illustrated in Plate 21, Figures 1-C and 1-D. Some phrases were common to a number of individuals, but the combination of these phrases was different in individual birds.

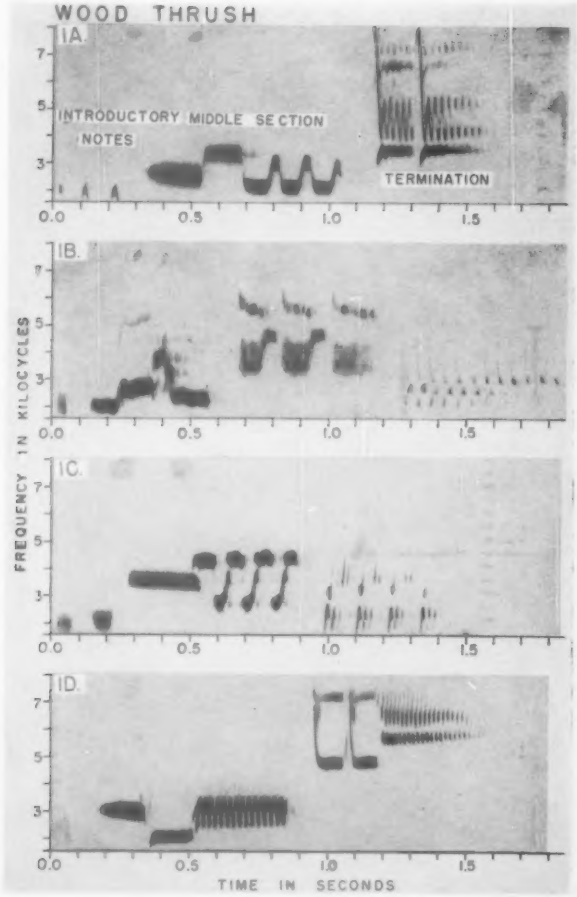
The terminal section, regularly the most complex part of the individual pattern, is characterized by having the highest average frequency of any section, and as being repetitious. At close range it frequently sounds buzzy or sometimes like a series of rapid clicks. Twenty-four variations were observed among the individual patterns studied.

In the termination, two notes are often sounded simultaneously. These notes are not harmonics, i. e. integral multiples of a fundamental frequency, and could not have been generated by the equipment. Plate 21, Figure 1-A, shows a lowest sustained note with a series of notes of higher frequency being alternated simultaneously.

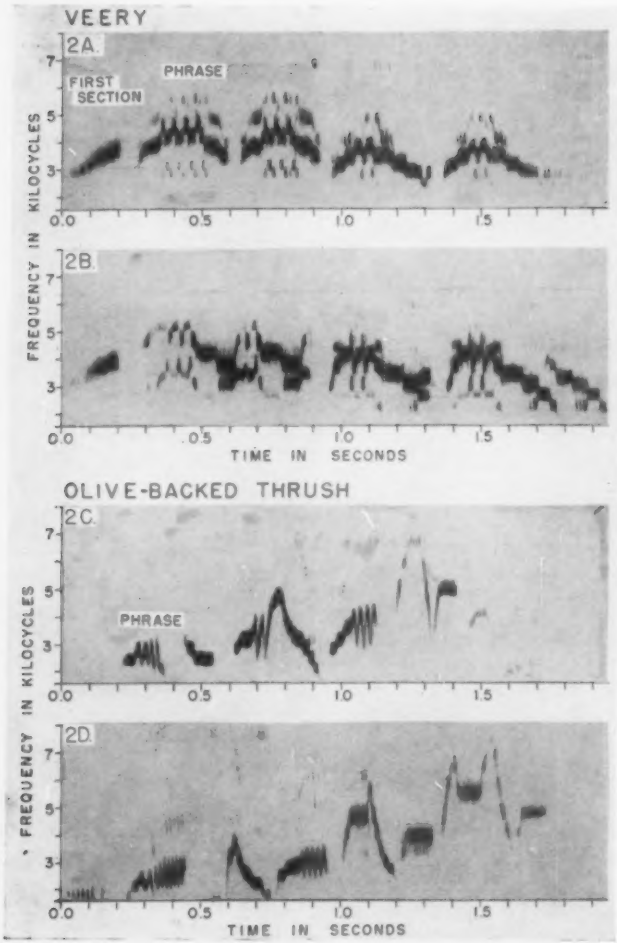
In some individual patterns a fourth section was observed, but this was regularly very similar to a phrase of the second section.

Although from previous studies parts of the individual patterns were known to be above 8000 cps., these parts were either of very short duration or were overtones and consequently were not used in these analyses. For recordings at normal speed, the sound spectrograph used has a high-frequency limit of 8000 cps.

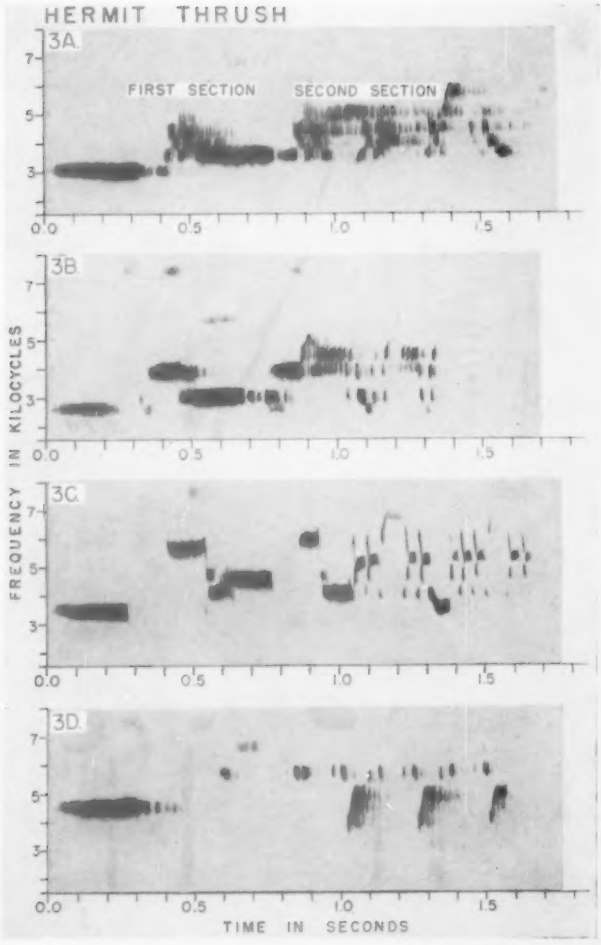
The time intervals and extreme frequencies for each of the three sections of the pattern, with the fundamental frequency averages rounded to the nearest 100 cps., are as follows (number of individual patterns measured in parentheses):



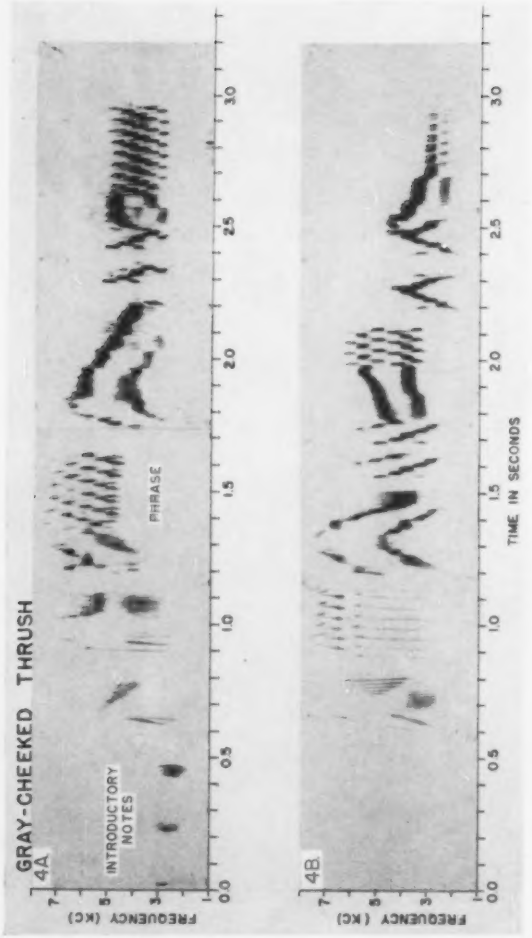
AUDIOSPECTROGRAPHS OF SONGS OF THE WOOD THRUSH



AUDIOSPECTROGRAPHS OF SONGS OF THE VEERY AND THE OLIVE-BACKED THRUSH



AUDIOSPECTROGRAPHS OF SONGS OF THE HERMIT THRUSH



AUDIOSPECTROGRAPHS OF SONGS OF THE GRAY-CHEEKED THRUSH

	Time interval (sec.)	*Highest frequency (cps.)*	*Lowest frequency (cps.)*
Introductory notes	0.21 (27)	1900 (40)**	
Middle	0.60 (49)	3600 (49)	2000 (49)
Termination	0.53 (48)	6800 (46)	3600 (46)
Total	1.56 (30)*		

* Total includes time interval between sections.

** Only the average frequency of the introductory notes was measured.

Veery—(*Hylocichla fuscescens*).—The following recordings were used in these analyses:

June 6, 1953, Sturgeon Point, Victoria Co., Ontario (5)
(recorded by W. W. H. Gunn)
June 23, 1949, Ashland, Wisconsin (5)
May 31, 1951, Ithaca, New York (5)
June 31, 1951, Ithaca, New York (5)
June 7, 1953, Swallow Falls State Park, Maryland (5)
(recorded by J. and N. Stillwell)

The "advertising song" of the Veery has two sections. The first of these is a long note, increasing in frequency (see Plate 22, Figures 2-A and 2-B).

The second section is composed of a series of phrases of essentially similar composition. Each phrase has a rising series of notes, then a series of short notes at different frequencies and arranged in a complex manner, and an ending with notes similar to the beginning, but decreasing in frequency.

Two shorter patterns, similar in general composition to the basic phrase, and uttered simultaneously with it, one each at a higher and a lower frequency, always were observed.

We recognize the species by a decrease in frequency in the "advertising song," which is easily observed in the spectrograms. Measurements of each of the phrases also suggest an increase in the length of each successive one. The following table gives the time interval

	Time interval	*Initial frequency*	*Highest frequency*	*Terminal frequency*
First section	0.24 (25)	2700 (24)	4300 (25)	
Second section				
Phrase I	0.34 (25)	3800 (25)	5300 (25)	3000 (25)
II	0.34 (25)	3400 (22)	5100 (25)	2900 (24)
III	0.36 (25)	2600 (21)	4200 (24)	2400 (24)
IV	0.46 (17)	2600 (17)	4400 (17)	2200 (17)
V	0.34 (4)	2300 (2)	4000 (4)	2100 (2)
VI	0.52 (1)	2400 (1)	4300 (1)	2300 (1)
Total	1.84 (25)			

and frequencies (averaged to the nearest 100 cps.) for each of the various sections and phrases.

The most common number of phrases observed in the second section was four, with a range from three to six. Three of the individuals had four phrases in each individual pattern, and one had a single pattern with three. The fifth Veery had double-peaked phrases in each of its individual patterns. A pattern from this individual is illustrated in Plate 22, Figure 2-B. For frequency measurements each peak was considered to be in a separate phrase.

Even considering the peculiar patterns exhibited by this last Veery, the species probably has less variation in sound pattern than any of the other *Hylocichla* thrushes. Spectrograms from birds recorded at Ithaca were almost identical; those from the Maryland recording show only minor variation. The most frequently observed variations are in the terminal phrase, which in each individual bird seems to have a characteristic form.

Hermit Thrush—(*Hylocichla guttata*).—The recording data for the five individuals studied is as follows:

June 20, 1951, Bay Pond, New York (8)
June 29, 1953, Whiteface Mountain, New York (5)
(recorded by J. and N. Stillwell)
June 17, 1951, Elk Lake, New York (5)
June 18, 1951, Elk Lake, New York (5)
June 11, 1953, Lake Pocono, Pennsylvania (5)
(recorded by J. and N. Stillwell)

Like the Veery and the Olive-backed Thrush, the sound pattern of the Hermit Thrush does not have a series of introductory notes. The sound pattern appears more variable than those of the other four species. To many people the pattern strongly suggests that of a Wood Thrush.

Aurally, the individual patterns of a Hermit Thrush may be divided into two categories on the basis of average frequency. Extreme examples are easy to distinguish, but intermediate forms, which occur quite regularly, present problems and make less apparent the distinctness of the extreme types. On the Stillwell (1953) recording, examples of both extremes are pointed out in the vocal commentary.

The sound pattern has two sections. The first contains some sustained notes in a pattern suggesting the middle section of the Wood Thrush song, to which it might well be homologous.

In this section there are frequently short time intervals without sound, as there are in the middle section of that Wood Thrush in-

dividual pattern which has two phrases. However, a time interval is sometimes absent between the two sections of the Hermit Thrush pattern. Plate 23, Figure 3-A, illustrates a series of short notes within the first section which is also found in the second section. Both sections have about the same time interval.

The second section is more complex and variable than the first and is in many ways similar to the terminal section of the Wood Thrush pattern. Plate 23, Figures 3-B, C, and D, shows some of the variation in individual patterns.

The spectrograms from individual birds are very different from one another. Two birds show distinct notes in the second section of their patterns, while the other three recordings show blurred notes. Each of the birds showed a wide frequency range in both sections of the sound pattern.

The averages derived from the 28 individual patterns analyzed from the five individuals follow:

	First section	*Second section*	*Total*
Time interval	0.76 sec.	0.77 sec.	1.59 sec.*
Low frequency	2700 cps.	2900 cps.	
High frequency	4900 cps.	5700 cps.	

* Includes time interval between sections.

Olive-backed Thrush (*Hylocichla ustulata*).—The spectrograms studied were made from the following recordings:

July 25, 1953, Bonaventure Island, Quebec (5)
June 22, 1948, Mount Washington, New Hampshire (5)
June 23, 1949, Bay Pond, New York (5)
June 17, 1951, Elk Lake, New York (5)
July 5, 1953, Whiteface Mountain, New York (5)
(recorded by J. and N. Stillwell)

Aurally the sound pattern of the Olive-backed Thrush is characterized by an increase of frequency. The spectrograms show that the sound pattern is not divisible into major sections, as are those of the other four species, but has instead a series of short phrases with an alternation of relatively higher and lower frequencies. A comparison of the lower or higher phrases, when studied in sequence, always shows a relative frequency increase, with the highest frequency near the end of the sound pattern.

No introductory notes are indicated on the spectrograms, or are noticeable on critical listening to the recordings. These phrases

seem like simplified versions of those of the Gray-cheeked Thrush and vary in number from three to ten (average seven).

Each individual tended to repeat phrases, but such similarity was not observed among individuals. The three New York recordings, unlike the others, each show alternations of two individual patterns. The six patterns (two each from three individual birds) are all different. Plate 22, Figure 2-D, shows a pattern from the Elk Lake recording.

Individual patterns of the Quebec recording all have essentially the same beginning, but with some addition and modification of phrases. The endings of the patterns are all different, two of them having echo-like, weak final phrases. The New Hampshire recording, a pattern of which is illustrated in Plate 22, Figure 2-C, has three different beginnings and three different endings, but no entire sound pattern was repeated among those analyzed.

Because of the large number of different phrases observed, the variety of ways in which they were combined, and the small number of representatives of each different phrase in the analyses made, no detailed frequency analysis of individual phrases was calculated. The following average figures, however, were derived from all the individual patterns:

Total time interval	1.62 sec.
Lowest frequency	1600 cps.
Highest frequency	6500 cps.

There are no sustained notes of the type found in the Wood and Hermit thrushes. There is also no indication of two notes being produced simultaneously, other than harmonics.

Gray-cheeked Thrush (*Hylocichla minima*).—Recordings of only four individual Gray-cheeked Thrushes were available for this study:

June 17, 1953, La Tabatière, Quebec (6)
June 29, 1953, Mount Mansfield, Vermont (5)
July 9, 1953, Mount Mansfield, Vermont (5)
(recorded by J. and N. Stillwell)
June 29, 1954, Fort Churchill, Manitoba (7)

The pattern of the Gray-cheeked Thrush is in many ways the most complex of the five species studied and is, on the average, the longest. Aurally it suggests that of a Veery with some added elements at the end. The commonly recognized call notes of the two species also sound very much alike, but no spectrograms of these were made.

The first section of the Gray-cheeked Thrush sound pattern is a series of introductory notes, which are all at one frequency in an individual pattern and are very similar to the introductory notes of the Wood Thrush. Although they were not observed in most of the spectrograms, this omission may have been owing in some cases to the fact that they were too weak to be picked up by the recording or analyzing equipment.

The second section of the sound pattern is composed of a series of complex phrases. There was a tendency for different birds to use some similar phrases, and to use them in a similar order within the section.

Each individual bird seemed to use a characteristic ending, except for one pattern of one bird. In contrast to this individuality, the first phrases tended to be similar among the various individuals. Figures 4-A and 4-B on Plate 24 illustrate sound patterns from the June 29, Mount Mansfield recording and the Fort Churchill recording, respectively. Some of the phrases show the complex arrangement of short notes, with more than one note being sounded simultaneously. Some phrases are repeated two or three times in an individual pattern. In several cases very similar phrases were observed in the spectrograms from individual patterns of both the Olive-backed and Gray-cheeked thrushes.

Individual birds repeated individual patterns regularly, although not in succession.

The highest frequency for almost all of the individual patterns was above 8000 cps. The endings of the terminal phrases varied from 2000 to 6000 cps. but were much less variable for any individual bird. The two recordings from Mount Mansfield, with almost the same terminal phrase, have different frequency ranges for the last part: one 3900–6300 cps., the other 2700–5300 cps. (averages from five observations each).

The average individual pattern length, exclusive of introductory notes, was 2.14 seconds. The number of individual introductory notes varied from zero to four, with 0.1 to 0.2 seconds between notes. The frequency range of these notes was 2600 to 3600 cps., although the range for an individual bird was not more than 200 cps.

The individual birds whose patterns were analyzed show a remarkable similarity of phrases among individuals. However, because of the complex arrangements of phrases, the songs of these individuals were distinct.

DISCUSSION

Each of the five species of *Hylocichla* has a general sound pattern which is distinct in many ways. Certain characteristics of these patterns may be found in more than one species.

The Wood Thrush song usually has a three-section pattern: the introductory notes, a middle section with sustained notes, and a termination usually at a distinctly higher frequency and having more complex frequency distribution.

The sound pattern of the Hermit Thrush has two sections, the first of which, like the middle section of the Wood Thrush pattern, regularly has long, sustained notes. The second section is more complex and often at higher average frequency, as is the terminal section of the Wood Thrush pattern. It frequently contains short notes in a repetitive arrangement at more than two frequencies. Introductory notes are lacking.

The Veery also has a two-section sound pattern. The first is a rising note, and the second is a series of phrases essentially similar to one another. This second section has a complex arrangement of short notes in each phrase. There is an average frequency decrease in the successive phrases.

The Olive-backed Thrush has a one-section sound pattern composed of a series of phrases of increasing frequency. The notes are relatively simple and pure. As in the Hermit Thrush and Veery, there are no introductory notes.

Similarly, the Gray-cheeked Thrush may appear to have a one-section sound pattern, since the introductory notes are often weak or absent. The remainder of the sound pattern is a series of phrases. There is no distinct general frequency trend, although there is some evidence for a high frequency peak in the middle of the pattern. The sound pattern of this species is the most complex of those studied. The phrases in some instances show a similarity to some at the beginning of the Olive-backed Thrush sound pattern. In some parts of the pattern, short notes at more than one frequency were observed.

With the exception of the Wood Thrush and Hermit Thrush, sympatric species have distinct contrasts in sound pattern. The Wood Thrush, which has a breeding range overlapping to some extent all of the other species except the Gray-cheeked Thrush, has characteristic sustained notes. The breeding range of the Hermit Thrush overlaps to some extent those of the other species except the Gray-cheeked Thrush. Its sound pattern is especially similar to that of the Wood Thrush. The pattern of the Olive-backed

Thrush contrasts in its relative simplicity to that of the Gray-cheeked Thrush and in frequency increase to that of the Veery. Certain phrases of both the Gray-cheeked and Olive-backed thrushes are very similar in pattern.

Sound patterns of species allopatric during the breeding season show some similar characteristics. This is true of the Veery and Gray-cheeked Thrush in sound quality, and of the Wood Thrush and Gray-cheeked Thrush in introductory notes. The apparently anomalous situation of the Wood and Hermit thrushes might be explained by the recent range extension northward of the former species into part of the range of the latter.

It is also suggested that species which have ranges overlapping the largest number of closely related species have sound patterns distinctive in different characteristics. In contrast to the other *Hylocichla* species the Wood Thrush has a three-section sound pattern with quite audible introductory notes. The Olive-backed Thrush has a relatively simple pattern of frequency distribution and a definite frequency increase. The Veery has a distinct frequency decrease and repetition of similar phrases.

Because all of the sound patterns analyzed were of "advertising songs," they were similar in function. These sounds have the same physical origin also. In order to be considered homologous, the songs must, by definition, be similar in structure. The following similar sections of patterns are from allopatric or recently sympatric species: the introductory notes of the Wood and Gray-cheeked thrushes; the middle section and termination of the Wood Thrush's song and the first and second sections of the song of the Hermit Thrush, respectively. The following, probably also homologous, have developed modifications in sound structure which appear to have resulted from selective pressures because of sympatry: the second section of the Wood Thrush's song and the first sections of the songs of the Veery and Hermit Thrush; the first section of the Hermit Thrush's and Veery's songs; and the second sections of the songs of the Hermit Thrush, Veery, and Gray-cheeked Thrush to the complete song of the Olive-backed Thrush.

The preceding analyses of sound patterns indicate the greatest similarity of component parts between the Wood Thrush and Hermit Thrush and between the Olive-backed and Gray-cheeked thrushes. The sound pattern of the Veery appears more closely related to that of the former pair.

I wish to express my appreciation for the coöperation and sugges-

tions of Drs. P. P. Kellogg, G. A. Swanson, C. G. Sibley, M. Moynihan, J. M. Cowan, W. W. H. Gunn, and W. C. Dilger and Mr. and Mrs. J. Stillwell.

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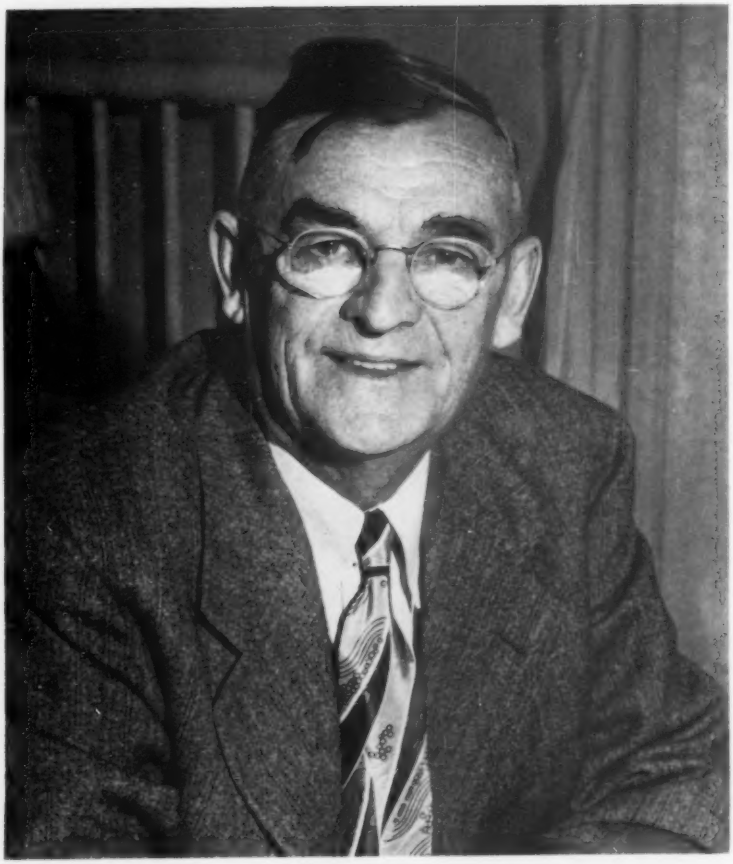

STANLEY GORDON JEWETT

IN MEMORIAM: STANLEY GORDON JEWETT

BY IRA N. GABRIELSON

STANLEY GORDON JEWETT was born in Fredericton, New Brunswick, on February 15, 1885, and moved with his family to California in 1895 where he attended school at Berkeley, Alameda, and near Healdsburg. After his father's death in 1897, the family returned to New Brunswick, where he finished grammar school and attended business college at Fredericton. In 1902, he went to Portland, Oregon, and spent a year at the Bartlett Ranch on Government Island, a farm which is now in a state wildlife management area. He went briefly back to New Brunswick, but returned in 1904, and from that time until his death on October 12, 1955, he was a resident of Oregon.

The Pacific Northwest was his chosen field of interest, and he left it only for brief intervals on collecting trips. The longest of these was for the Field Museum of Chicago in company with Dr. Wilfred H. Osgood to collect birds and mammals in Colombia and Venezuela in 1910 and 1911. During the interval between 1904 and 1910, he worked at various jobs around Oregon, but, whatever he was doing, he never lost interest in the out-of-doors and particularly in the birds and mammals.

In 1910, he was given a temporary appointment in the Biological Survey (Fish and Wildlife Service) and for several years continued to work on the biological surveys of Oregon, North Dakota, Wyoming, and Idaho, working in Oregon for the Biological Survey and the Oregon Game Commission on a co-operative project between those two agencies.

After 1916, he was continuously employed by the Biological Survey and the Fish and Wildlife Service in various capacities until his retirement in November of 1949. During that time, he worked on various surveys, handled predatory animal control work in Oregon and Washington, and later both rodent control and predatory animal work in Oregon.

He served for a time as superintendent of the Malheur National Wildlife Refuge when it was being restored and had appointments as flyway biologist, refuge division biologist, and wildlife research biologist for the regional office.

He married Edna Isabella Myers of Portland on August 6, 1907, and is survived by her and two children, Stanley G. Jewett, Jr., a biologist with the Fish and Wildlife Service, stationed at Portland, and Mrs. Leslie Hall who also lives in Portland.

Stan Jewett was one of a diminishing group of naturalists. While

his principal interest was in birds and mammals, he had a genuine interest and a good working knowledge of the flora and fauna of the Pacific Northwest. Prior to my transfer to that area in 1918, I felt that I already knew Jewett because I had read so many of his field notes and examined the stomachs of so many birds he had collected. As we were both working for the same organization, although he was then stationed in Pendleton, Oregon, and I in Corvallis, we soon became acquainted, and from that time made field trips together whenever our work permitted us to travel in the same territory. As the work to which we were assigned developed in eastern Oregon, we arranged more and more trips together in that country. Traveling in a Model T Ford in those days was quite an adventure in itself. Roads were practically non-existent, and the distance that could be made in one day was dependent upon many things besides the number of hours of travel. We commonly carried with us food, bedrolls, extra water, gas, oil, and tools for repairing the unpredictable Ford. Sometimes we made twenty miles a day, sometimes we could make a hundred and carry on our other activities. Usually we camped where night overtook us and, from the first, made it a practice to put out a line of small mammal traps each evening. When it was possible to do so, we also did some bird collecting. We spent many evenings skinning birds in front of the car lights when we failed to finish before dark. While we did not make too much speed, it was still faster than any other mode of travel, and we did get thoroughly acquainted with the country and with its wildlife.

Jewett was one of the best field men I have ever known. He was energetic, covered the country thoroughly, and knew the birds and mammals well. It was always a pleasure to be with him in the field. Early in our association we learned that each of us was writing up notes on work done in North Dakota. As a result of our discussions, we decided to combine our notes into one paper, the first of a series of joint activities that carried on over the years until we published our collective notes in "The Birds of Oregon" in 1940.

Both of us habitually kept daily field notes while on our regular duties and frequently took our vacations to visit areas of the state that we did not get to visit regularly. Working together, we gradually covered every part of the state and eventually became especially interested in the offshore birds. In association with the late J. C. Braley, we made as many offshore trips as we could finance out of our slender personal incomes and gathered information on the offshore movements of birds along the Oregon coast.

In later years, when it was not possible for us to continue our joint

travels, we made brief excursions together whenever possible. We had many memories of good trips to share, particularly the offshore trips, our excursions into the great sagebrush areas of southeastern Oregon, and those into the Wallowa Mountains, an area which fascinated us.

Jewett was a good fly fisherman and habitually carried a fly rod, partly because it was sometimes necessary to live off the country and also because he thoroughly enjoyed fishing and a chance to watch the wildlife around him. He was a good hiker and camper, and a first-class field observer. Few men ever lived who knew the birds and mammals of the Pacific Northwest so well. His interest continued after his retirement in 1949, and he continued field work as long as his strength permitted. One of his greatest complaints on our last few visits was the fact that he could no longer be as active as he had been.

Jewett was elected a Fellow of the American Ornithologists' Union in 1940 and was granted an honorary Doctor of Science degree by Oregon State College in 1953. He had earned these honors by a lifelong of work in his chosen field.

He was not only a good field man but was thoroughly acquainted with most of the literature relating to birds and mammals of the Northwest. He spent many hours checking records and literature to correlate his own records with previous knowledge. While desk work irked him and he much preferred to be out of doors, he did produce many papers on birds and mammals during his active career. In addition to the "Birds of Oregon," he was one of the authors of the re-recently published "Birds of Washington State." As a result of many years of week-end trips in the vicinity of Portland, we prepared "The Birds of Portland and Vicinity," published as Pacific Coast Avifauna No. 19 of the Cooper Club's Avifauna series. This joint project eventually grew into an effort to put together the available information on Oregon birds and resulted in other joint publications. In addition to these books and papers, his bibliography contains about 80 titles of shorter notes, articles, and radio talks on birds, mammals, and conservation.

Jewett was an enthusiastic and persistent collector. He made excellent skins of both birds and mammals. In addition to those that went to the Field Museum and to other museums for which he worked in his early years, there are many hundreds of specimens collected by him in the U. S. National Museum and in the Fish and Wildlife Service Collection. The largest part of his private collection is now in the San Diego Museum. Material collected since he transferred his large collection there some years before his death has gone to the

College of Puget Sound. This institution also has received most of his library.

In addition to his keen interest in taxonomy, distribution, and habits of birds and mammals, Jewett had a continuing interest in conservation affairs. He and W. L. Finley worked for many years to build public support for the creation of the Malheur Refuge and the Hart Mountain Refuge in Oregon. He was always willing to stand and fight for anything in which he believed, and as his knowledge and reputation spread, he became increasingly influential in conservation affairs in the Pacific Northwest.

He will be sorely missed by those who were associated with him in these conservation activities, and his passing leaves a gap among the field ornithologists of this country. Men of his broad knowledge are becoming scarce in these days of increasing specialization, and there is need for men trained in the broader as well as the specialized biological fields. He was largely self-trained, but he did an excellent job and made a name for himself that will live long in the Pacific Northwest.

Route 1, Box 349, Oakton, Virginia, May 1, 1956.

VARIATION IN *DECONYCHURA LONGICAUDA* IN CENTRAL AMERICA AND COLOMBIA

BY THOMAS R. HOWELL

THE Long-tailed Woodcreeper (*Deconychura longicauda*) is one of the least common of the dendrocolaptids found in Central America. The range of the northernmost subspecies, *typica*, is given by Peters (1951) as southwestern Costa Rica and western Panamá east to the Río Calovébora (= Calovévora). On January 21 and 22, 1953, I collected two birds of this species at Arenal, 25 km. east of Jalapa, Department of Nueva Segovia, Nicaragua. This locality is at an elevation of 1200 ft. in primeval rain forest near the western edge of the Caribbean slope in extreme northern Nicaragua. As Arenal is several hundred miles north of the previously recorded range of the species, I compared my two specimens with a few examples of *typica* from Costa Rica to see if there were any detectable differences. The variability of these few birds prompted me to assemble a series of virtually all Central American specimens of *Deconychura longicauda* in United States museums, a total of 29. In addition to the two Nicaraguan birds, there are 20 from Costa Rica (and measurements of one other subsequently made into a skeleton) and seven from Panamá, including the type of *darienensis* Griscom. I have also examined what I believe to be all specimens of this species from Colombia, a total of nine, including the type of *minor* Todd. Other South American forms were not studied as they are outside the scope of the present work; the most recent review of the entire genus is still that of Zimmer (1929). Dorsal and ventral views of selected specimens examined, including types, are given in Plates 26 and 27.

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I am grateful to the following ornithologists and their institutions for the loan of specimens used in this study: Emmet R. Blake of the Chicago Natural History Museum (CNHM), James Bond of the Academy of Natural Sciences of Philadelphia (ANSP), Herbert Friedmann of the United States National Museum (USNM), James C. Greenway of the Museum of Comparative Zoology (MCZ), Kenneth C. Parkes of the Carnegie Museum (CM), Kenneth E. Stager of the Los Angeles County Museum (LACM), Robert W. Storer of the University of Michigan Museum of Zoology (UMMZ), and John T. Zimmer of the American Museum of Natural History (AMNH). The abbreviations in parentheses are those used in Table 1. I am also indebted to Henry O. Havemeyer of Mahwah, New Jersey, for in-

TABLE 1

LOCALITY, DATE OF COLLECTION, AND MEASUREMENTS (IN MM.) OF SPECIMENS OF *Deconychura longicauda* FROM CENTRAL AMERICA AND COLOMBIA

Museum Number	*Locality Number*	*Locality*	*Date*	*Males*			*Females*		
				Wing	*Tail*	*Culmen (from nostril)*	*Wing*	*Tail*	*Culmen (from nostril)*
UCLA 34566	1	Nicaragua: Dept. Nueva Segovia; Arenal, 25 km. E. of Jalapa (1200 ft.)	Jan. 21, 1953	96.1	90.0	15.8			
UCLA 34567	1	Nicaragua: Dept. Nueva Segovia; Arenal, 25 km. E. of Jalapa (1200 ft.)	Jan. 22, 1953	99.6	97.5	17.7			
UCLA 34491	2	Costa Rica: Alajuéla Prov.; Quebrada Azúl de San Carlos (800 ft.)	Mar. 22, 1934				83.0	80.0*	14.0
AMNH 390570	3?	Costa Rica: Limon Prov.; Hacienda La Ibérica (400 ft.)	Apr. 18, 1925	101.2	99.5	15.5			
UMMZ 132541	4?	Costa Rica: Cartago Prov.; El Sauce	Oct. 19, 1950				81.5	90.2	13.0
LACM 16268	5	Costa Rica: Puntarenas Prov.; Las Agujas (50 ft.)	Apr. 30, 1929	98.3	97.0	15.5			
LACM 16269	5	Costa Rica: Puntarenas Prov.; Las Agujas (50 ft.)	May 10, 1929	99.5	molt	15.6			
MCZ 116982	6	Costa Rica: San José Prov.; Pózo Azúl	Mar. 20, 1898	101.8	95.0	16.0			
AMNH 525407	6	Costa Rica: San José Prov.; Pózo Azúl	May 12, 1902				88.5	85.1	15.2
AMNH 525406	7	Costa Rica: ?Puntarenas Prov.; Pózo de Pital	Mar. 7, 1893	99.4	98.0	17.0			
USNM 198295	7	Costa Rica: ?Puntarenas Prov.; Pózo de Pital	Mar. 16, 1893				85.0	89.0	13.8
MCZ 123195	8	Costa Rica: Puntarenas Prov.; El General	June 29, 1908				86.7	87.5	13.4
UMMZ 132550	9?	Costa Rica: Puntarenas Prov.; 3 mi. N. of Piedras Blancas	Aug. 23, 1951				85.0	86.5	13.7*
UMMZ (skel.)	9?	Costa Rica: Puntarenas Prov.; 3 mi. N. of Piedras Blancas	Aug. 23, 1951	100.0	96.0	—			
UMMZ 132542	10	Costa Rica: Puntarenas Prov.; Las Animas, Buenos Aires	May 4, 1952				84.0	82.5	14.1
CM 28551	11	Costa Rica: Puntarenas Prov.; El Pózo de Térraba	July 8, 1907	molt	94.8	16.0			
AMNH 175016	11	Costa Rica: Puntarenas Prov.; El Pózo de Térraba	June 20, 1907	98.0	95.5	—			
CM 28396	11	Costa Rica: Puntarenas Prov.; El Pózo de Térraba	June 21, 1907				89.5	molt	14.5
CNHM 7084	12	Costa Rica: Puntarenas Prov.; Palmar	Feb. 7, 1892	95.0	90.5	15.6			
AMNH 360569	13?	Costa Rica: Puntarenas Prov.; Volcán de Osa (500 ft.)	Oct. 4, 1923	98.0	97.2	16.1			
AMNH 390567	14	Costa Rica: Puntarenas Prov.; Puerto Jiménez	July 31, 1922	95.3	95.3	15.2			
CNHM 69206	14	Costa Rica: Puntarenas Prov.; Puerto Jiménez	Dec. 4, 1929	94.7	99.0	14.6			
AMNH 390568	14	Costa Rica: Puntarenas Prov.; Puerto Jiménez	July 19, 1922				84.6	87.5	14.0
MCZ 107892	15	Panamá: Chiriquí Prov.; Divala	Dec. 6, 1900	97.2	91.3	16.0			
AMNH 525408	16	Panamá: Chiriquí Prov.; Bogava (Bugaba) (800 ft.)	Nov. 5, 1903	95.0	93.5	16.5			
AMNH 247595	17	Panamá: Bocas del Toro Prov.; Almirante (500 ft.)	June 28, 1927				87.0	84.5	14.0
AMNH 246794	18	Panamá: Bocas del Toro-Veraguas Prov. border; Guaval, Río Calovévora (800 ft.)	Sept. 18, 1926				86.0	84.0	13.5
USNM 41587	19	Panamá: Canal Zone; Lion Hill	Illegible			Unsexed; too battered to measure			
MCZ 152426	20	Panamá: Panamá Prov.; Port Antonio, Río Chepo	Feb. 22, 1927				86.0	84.0	13.2
MCZ 140513	21	Panamá: Darién Prov.; Cana (2600 ft.) (type of *darienensis*)	Aug. 6, 1928				85.5	80.5*	13.0
USNM 426231	22	Colombia: Dept. Antioqua, Nicolf	Jan. 28, 1950				85.5	82.5*	13.8
ANSP 160723	23	Colombia: Dept. Córdoba, Quimarí (700 m.)	Apr. 27, 1949	99.4	89.5*	—			
ANSP 160721	23	Colombia: Dept. Córdoba, Quimarí (700 m.)	Mar. 22, 1949	99.0	91.0*	14.3*			
ANSP 160722	23	Colombia: Dept. Córdoba, Quimarí (700 m.)	Mar. 30, 1949	98.0	93.5*	15.8			
ANSP 160724	24	Colombia: Dept. Córdoba, Murucucú (500 m.)	May 26, 1949				87.2	84.5*	—
USNM 426232	25	Colombia: Dept. Antioqua; Villa Artiaga, 7 km. NE. of Pavarandocito (400 ft.)	Apr. 17, 1950	93.2*	96.0	14.5			
CM 59022	26	Colombia: Dept. Santander, El Tambor (type of *minor*)	Dec. 11, 1916	92.0	89.0*	14.5			
CM 59296	26	Colombia: Dept. Santander, El Tambor	Jan. 15, 1917				88.5	85.0	13.5
USNM 411260	26	Colombia: Dept. Santander, Hcda. Santana, 8 mi. NE. of Conchal (2000 ft.)	Oct. 29, 1949	94.0	100.0	14.5			

* Structure heavily abraded, broken, or incompletely grown.

formation on his collection, and to Robert D. Burns for taking the photographs used herein.

LIFE HISTORY

Almost nothing has been published on the habits and ecology of the Long-tailed Woodcreeper in Central America, and what little has been recorded can be summarized briefly. The species seems to inhabit deep forest of the humid tropical zone from sea level to as high as 2600 feet. No unusual habits have been reported, and behavior is probably similar to that of other medium-sized Dendrocolaptidae. Only seven of the specimens before me have information on the label as to gonad condition. A female (USNM 198295) with two fresh eggs was taken on March 7, 1893; one (UMMZ 132542) with the ovary greatly enlarged was taken on May 4, 1952; another (UMMZ 132550) with the ovary slightly enlarged, was taken on August 23, 1951. A male (AMNH 390570) marked "testes maximum" was taken on April 18, 1925. Birds with gonads not enlarged have been taken in the months of June, August, September, and January. These meager data suggest that breeding takes place primarily during the early months of the year, possibly continuing on into midsummer. Five specimens, taken from the end of April through May, June, and early July, exhibit replacement of wing, tail, and body feathers. Birds taken in all other months of the year are not in molt. This suggests that there is a single post-breeding molt by adults. One specimen (UMMZ 132541) taken October 19, 1950, has very downy abdominal plumage and is surely an immature of the year. On the other hand, birds showing various stages of wear have been taken in all months of the year. The rectrices are especially subject to abrasion, and they are often worn down asymmetrically.

There is no evidence of migration, but the data by no means rule out the possibility that it may occur.

TAXONOMY

This woodcreeper is not a strikingly marked species. A general description of its appearance, with no attempt to indicate precise shades of color, may prove helpful and is as follows: upperparts largely olive brown, pileum darker and with buffy shaft streaks; upper tail coverts rufous; an indistinct buffy superciliary stripe; auricular and malar areas streaked with buffy and dusky brown; throat buffy; pectoral area with buffy spots margined with dark brown; abdomen light olive brown variously streaked with buffy, especially anteriorly; under tail coverts rufous, sometimes faintly streaked with buffy;

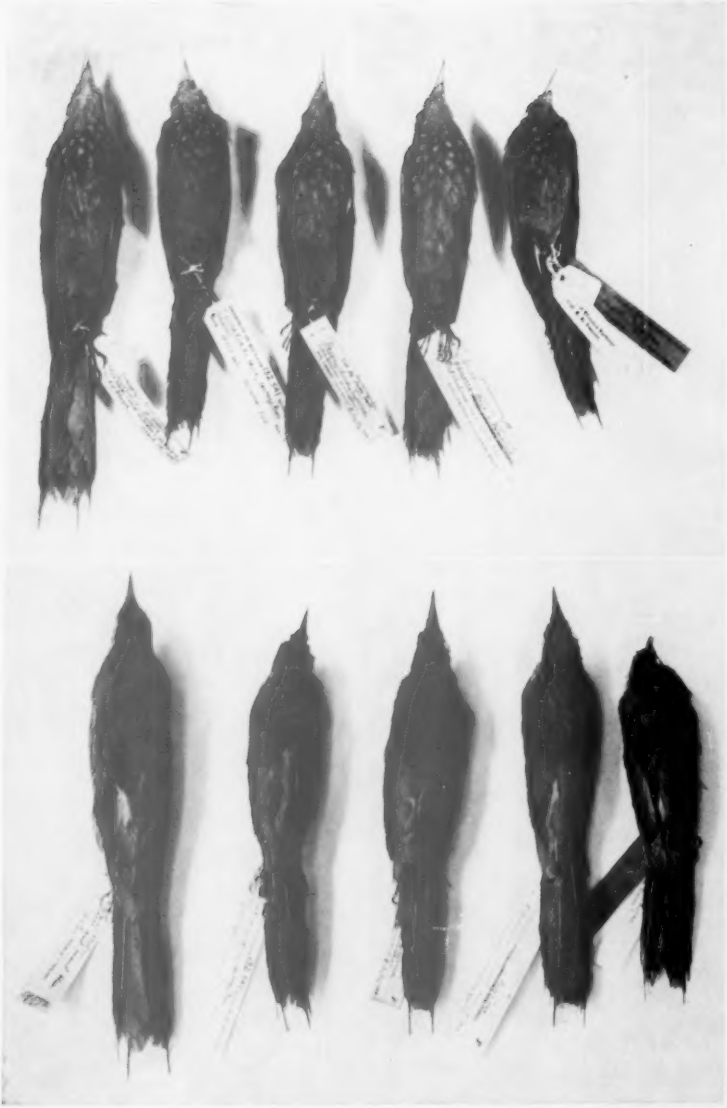
wings largely rufous chestnut; wing linings pale cinnamon buff; tail chestnut; bill straight, about as long as the head proper; culmen slightly decurved at tip. The sexes are alike in color, but males are usually larger in all dimensions. For more detailed descriptions, see Ridgway (1911) and Zimmer (1929).

Subspecies of *Deconychura longicauda* are characterized by differences in both color and size. Measurements of culmen from the anterior edge of the nostril, wing, and tail of all specimens examined by me are given in Table 1. As the habitat of this species is essentially

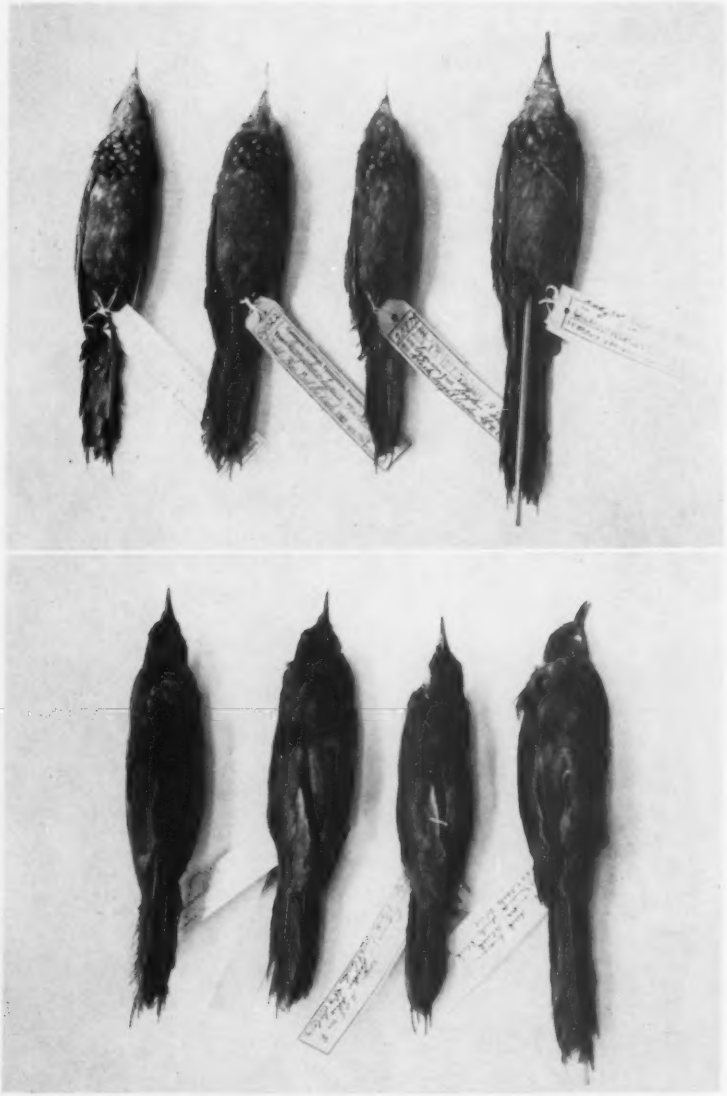
FIGURE 1. Outline map of Nicaragua, Costa Rica, Panama, and northwestern Colombia, showing localities listed in Table 1.

continuous throughout the Central American part of its range, any regular variation might be expected to be clinal in a direction corresponding to the long axis of this relatively narrow land mass. Therefore, the birds are arranged by locality from north to south and southeast, following the configuration of Central America. Each locality has been given a number, and these have been mapped in Figure 1. A question mark in Figure 1 indicates a locality that is accurate in general but uncertain in detail.

Two specimens (UCLA 34566, UMMZ 132541) were not sexed by the collector but can be allocated on the basis of their measurements. One (AMNH 247595), although labelled "♂ TNE" (= testes not enlarged), is almost certainly mis-sexed and is here considered a female.



DECONYCHURA LONGICAUDA. Ventral and dorsal views of AMNH 390570, UMMZ 132541, AMNH 390568, MCZ 152426, and MCZ 140513 (type of *darienensis*). Data for each specimen are given in Table 1.



DECONYCHURA LONGICAUDA. Ventral and dorsal views of USNM 426231, CM 59022 (type of *minor*), CM 59296, and ANSP 160722. Data for each specimen are given in Table 1.

These measurements fail to reveal any clines or any sort of regular variation in size. There is no overlap between the sexes in wing length and only slight overlap in the other two measurements. In Central American males, tail length exceeds wing length in only one instance, whereas in females tail length is greater in five cases. Wing and tail lengths appear to vary independently of each other in both sexes, and culmen length is not consistently correlated with either wing or tail length.

The following remarks on color variation apply only to Central American birds excluding the type of *darienensis;* this specimen and the Colombian birds will be discussed presently.

The color and distinctness of the buffy shaft streaks on the pileum vary from pale and well marked (USNM 198295, CNHM 7084) to dull and obscure (CNHM 69206, AMNH 390568). The size and distinctness of the streaks and/or spots on the nape are equally variable. Back color seems deeper and brighter in some specimens than in others, but the variation is slight and the paler and duller individuals are in more worn plumage. Also, the preparation of the skin influences the appearance of the back color, for the area just back of the nape is duller than the more posterior part of the back. An elongate skin shows these duller feathers more prominently and over a wider area than does a "telescoped" specimen.

Buffiness of the throat is variable. The throat feathers are darkest at the edges, and wear influences the color by reducing the margins. Color varies from deep buffy (UCLA 34567, UMMZ 132550, AMNH 247595) to pale buff (MCZ 123195, MCZ 107892). The color of the pectoral spots varies directly with throat color. The shape of the spots is generally diamond-like or sagittate (UCLA 34491, UMMZ 132542, AMNH 390570), but often the sharp outlines are rounded (AMNH 247595, MCZ 123195) or the spots may be drop shaped (LACM 16269). The size of the spots seems to vary with body size—larger in males, smaller in females. The color of the margins of the pectoral spots varies from blackish brown (CNHM 69206, AMNH 390570, AMNH 247595) to paler shades of brown (USNM 41587, CM 28396) but is always darker than the flanks or abdomen. Worn birds usually have paler margins, but not always (LACM 16269, CNHM 7084). Buffy markings on the abdomen vary from few and faint (UCLA 34566, UMMZ 132541 [imm.], AMNH 246794) to linear and well defined (UMMZ 132550, AMNH 247595), to broad and poorly defined (MCZ 152426, MCZ 123195). When the markings are few, they are confined to the anterior part of the abdomen. In those birds in which the streaking is heavy, there are usually some

faintly buffy streaks along the shafts of the under tail coverts. The rufous color of the latter varies in depth and brightness.

The presence or extent of rufous color on the scapular border of the wing seems to be a matter of individual variation. It may be well marked (CNHM 7084) or almost absent (CM 28396) or anything in between. The intensity of the cinnamon buff color of the wing linings is not constant. There is little or no variation in color of the remiges and rectrices.

No regular or clinal variation in coloration is apparent, nor is there consistent correlation of color and size characters.

The subspecific identity of the specimens examined should now be considered in the light of the extent of individual variation outlined above.

The two Nicaraguan specimens have no characters distinguishing them from a series of *typica* and are referable to that subspecies. The range of *typica* therefore extends as far as the Caribbean slope of extreme northern Nicaragua. All Costa Rican specimens are of course referable to *typica*.

The allocation of Panamanian specimens is somewhat more difficult and has a confusing history. Griscom (1928) provisionally identified birds from Almirante, in western Panamá, as *minor*, a supposedly small, pale race described by Todd (1919) from northern Colombia. Griscom later (1929) described *darienensis* from a single female specimen from Cana, Darién, in eastern Panamá, and at the same time cast further doubt on the identity of the birds from Almirante. Zimmer (1929) included specimens from western Panamá in *typica*, and doubted that *darienensis* was distinct from *typica;* he had not had an opportunity to examine the unique type. Griscom (1933), reporting on birds in the collection of Henry O. Havemeyer taken by A. P. Smith, assigned three females from the Río Chepo in eastern Panamá to *darienensis*, stating that these and the type averaged smaller and darker than a series of *typica* from Costa Rica, but mentioned that the Río Chepo birds were from a less humid area than Cana and were about "75% typical" of *darienensis*. He gave no measurements and presumably meant that they were paler than the type. Peters (1951) followed Griscom in calling these birds *darienensis* but questioned the validity of the race. He regarded it as doubtfully distinct from *minor*, not *typica*.

As the complete description of *darienensis* (Griscom, 1929) is quite short, it may be quoted here in full. "*Type.* No. 140,413, M.C.Z.; [140513 on white label] adult; Cana, eastern Panama; August 6, 1928; Rex B. Benson."

"*Characters.*—similar to *D. t.* [=*l.*] *typica* Cherrie of southwestern Costa Rica, but smaller and much darker; upper parts darker and more olive brown, less umber; underparts similarly darker and more olive; buffy of chin, throat and breast spots deeper, the border to the breast spots almost blackish; bend of wing only faintly washed with dark cinnamon; wing 85.5; tail, 80.5; culmen, 18."

The Museum of Comparative Zoology has kindly allowed me to borrow the type of *darienensis* and one of the specimens from the Río Chepo that is now in that collection. The press of other affairs has prevented Mr. Havemeyer from locating the other two Río Chepo birds, and I have thus been unable to examine them. However, there is no indication in Griscom's paper (1933) that the specimens differed noticeably from one another, and Mr. Havemeyer's recollection is that they were altogether similar. I have assumed, therefore, that the other two specimens from the Río Chepo are essentially the same as the one examined by me. I have compared this one and the type with all the other *Deconychura* available to me. The wing lengths of both these specimens (85.5 and 86.0 mm.) are longer than those of six out of nine females of *typica* from Coast Rica. The tail length of the type of *darienensis* is given as 80.5 mm., which would make it shorter than that of any unworn female of *typica*. In the type, however, the two central tail feathers (which are the longest in this genus) are broken off near their bases. As these feathers usually project about four or five mm. beyond the next longest, the true tail length is probably about 85 mm. The Río Chepo bird has a tail length of 84.0 mm., and both are well within the size range of *typica*.

The type of *darienensis* is a dark individual. The breast region seems especially heavily pigmented, for the skin is strongly "telescoped" so that the blackish brown edgings to the pectoral spots are crowded closely together. A feather by feather comparison shows, however, that these dark margins are no blacker than those of several examples of *typica* from Costa Rica, such as AMNH 390568. The color of the back is also matched by several *typica* (UMMZ 132550, CM 28396), as is the buffy of the chin, throat, and breast spots (UMMZ 132550, AMNH 247595). The amount of cinnamon color on the bend (scapular border?) of the wing is too variable to be used as a taxonomic character. The general color of the abdomen is not as dark as that of some examples of *typica* (AMNH 390568, CNHM 69206) and is matched by several others, but the abdominal feathers of the type differ in having an extremely faint barring caused by pale tips or edgings and obscure darker subterminal bands. This pattern is so faint that it is noticeable only on close examination, and I doubt that it has any taxonomic significance.

In the type, the culmen from nostril measures 12.7 mm. This is shorter than that of any other Central American specimen, and the next smallest measure 13.0 (UMMZ 132541) and 13.4 (MCZ 123195). UMMZ 132541 is an immature female, and both it and the type differ from all others examined by me in that the tip of the culmen is straight and not decurved. This suggests the possibility that the tip of the bill has not attained its full development in either. The type, however, has no other characters indicating immaturity; the abdominal feathers are fairly worn and not downy. In any case, the culmen-from-nostril measurement of the type is only 0.7 mm. less than that of the next smallest adult, and in view of the variability of the species this difference is slight indeed.

In summary, the type of *darienensis* is matched by examples of *typica* in all respects but two—the extremely faint barring of the abdomen and the slightly shorter culmen. In my opinion, the abdominal patterning is much too faint and the difference in culmen length too small to merit nomenclatural recognition. It is conceivable that a series of birds from Darién would show constant differences from *typica*, but at present there is no such series. The Río Chepo bird seen by me is no darker than even the paler examples of *typica* and no smaller than most of them in any dimension (see Plate 26). These facts were doubtless noted by Peters and led him to suggest that *darienensis* was not distinguishable from the pale race *minor*. However, as Griscom (1929) pointed out, the characters of the type of *darienensis* do not resemble those ascribed to *minor*. Furthermore, all other birds from Panamá (including the Río Chepo specimen) are within the range of variation of *typica* in both size and color. I feel, therefore, that all Central American specimens of *Deconychura longicauda* are referable to *typica*, and that *darienensis* is not separable from that subspecies.

The status of the nine birds from Colombia is not as clear cut as might be hoped. In Table 1 they have been arranged by locality in order of increasing distance from Central America, and this aligns them in an approximately west-to-east order. The specimens are all from the northwest quarter of Colombia, from localities at elevations from sea level up to about 2300 feet. Gonad size is indicated on USNM 426231 (ovary enlarged) and USNM 426232 (testes greatly enlarged); the dates of collection of these specimens suggest that the breeding season is at about the same time as it is in Central America. USNM 426232 and CM 59296 show new, incompletely grown remiges and rectrices, and the former exhibits some new feathers coming in on the upper breast. The plumage of the other parts of these two and

the entire plumage of all the others except USNM 426231 is considerably worn; the latter is noticeably worn only on the tail.

Todd (1919) described the race *minor* as follows: "Similar to *Deconychura typica* [= *longicauda*] *typica* Cherrie, but somewhat smaller; upper parts more olivaceous, less rufescent, and buffy markings of underparts paler and more restricted, wing (type), 92; tail 89; exposed culmen 22; tarsus, 19."

"Type, No. 59,022, Collection Carnegie Museum, adult male; El Tambor, Santander, Colombia, December 11, 1916; M. A. Carriker, Jr."

Todd's series presumably consisted of two birds, the type and a female (CM 59296) from the same locality. Zimmer (1929), doubtless noting that the measurements of the female were within the size range of *typica*, qualified Todd's diagnosis by stating "size possibly smaller." To this I would add that the tail of the type is so severely abraded that the distal portion is in tatters; the measurement of 89 mm. is probably about 5 mm. too short.

DeSchauensee (1950), having before him the large males from Quimarí (ANSP 160721, 160722, 160723), suggested that the type of *minor* was mis-sexed in order to account for its small measurements. However, the fact that no known female of this species from either Central America or Colombia has a wing more than 90 mm. long and since two recently taken males (USNM 411260 and 426232) from Colombia have wings almost as short as those of the type, one must consider the latter correctly sexed as a male.

The nine Colombian specimens should now be considered in the order in which they appear in Table 1. USNM 426231 is quite buffy on the underparts, more so than any of the other Colombian birds, and is indistinguishable both in color and size from several examples of *typica*. The locality at which it was taken is, geographically if not politically, just east of the junction of the Central American isthmus with South America, and it is not too surprising that this specimen has the characteristics of *typica*. The other eight Colombian specimens have, with moderate variation, the color characters ascribed to ***minor*** —more olivaceous back and paler, less buffy underparts. The measurements, on the other hand, vary within a wide range, and the sexes must be considered separately.

The type of *minor* has the shortest wing of any known male of this species. The primaries are worn, but probably not enough to affect the measurement by more than one or two mm. The culmen from nostril length is shorter by 0.1 mm. than that of the smallest male *typica*, but the true (unworn) tail length would be well within the size

range of *typica*. USNM 411260 is a topotype for all practical purposes; its wing and culmen measurements are about the same as the type, but the tail is the longest of any measured by me. The wing length of USNM 426232 is perhaps a little too short as the new wing feathers may not be fully grown—the sheaths are still complete near the proximal ends—but the tail is rather long and the culmen is the same as in the type and topotypical male. The three males from Quimarí, however, are quite large in all characters that can be accurately measured. The tails are extremely worn in all three, and the culmens are broken in two. These birds are apparently like *typica* in size, but they are as pale or paler than those from the type locality of *minor*. The specimens from Quimarí and Murucucú are in worn body plumage, and my first impression was that they were only faded examples of *typica*. Some worn examples of *typica* are as pale, but none lack the buffy tone of the underparts to the extent that the Quimarí and Murucucú birds do.

One of the Colombian females (USNM 426231) is, as mentioned previously, referable to *typica*. The other two, including a topotype of *minor*, are not outside the size range of *typica* in any dimension and are not even close to the lower limit of that range. The topotype, in fact, approaches the larger examples of *typica* in wing length.

It is obviously impossible to come to a definitive conclusion on the taxonomy of these Colombian specimens, but some tentative decisions may be made. First, USNM 426231 may be assigned to *typica*, extending the range of that subspecies into extreme northwestern Colombia. The male birds from the Department of Córdoba can be considered as representing the upper limit of size of *minor* or their large measurements may indicate intergradation with *typica*. Neither of these alternatives is entirely satisfactory. If the first is accepted, the size variation of *minor* is great indeed, with considerable overlap with *typica*. If the second is correct, it seems odd that the intergrades combine, without apparent modification, the size of *typica* with the coloration of *minor*—as though these were "either-or" characters. One would expect that intermediates would instead be slightly smaller than most *typica* and somewhat buffier than most *minor*. My inclination is to consider the Quimarí and Murucucú specimens as intergrades as these localities seem to be intermediate between the ranges of the two forms.

The other four birds may all be considered *minor*, but some slight recharacterization of that subspecies is necessary. The coloration is similar to that of *typica*, but with the upper parts more olivaceous and the entire underparts less strongly suffused with buffy, resulting in

paler, more whitish markings and a paler, more grayish abdomen and flanks. The extent of the markings on the abdomen may or may not prove to be more restricted; this is a highly variable character in *typica* and some examples are less extensively marked than is the topotypical female of *minor* (CM 59296). Zimmer (1929) found that the lores and auriculars of *minor* were whiter, less buffy, than in *typica*. The lores do not appear less buffy than those of many *typica* to my eye, but the basal part of the shafts of the auriculars seems to be somewhat whiter in *minor*. The few specimens available indicate that males of *minor* have a slightly shorter wing and culmen than those of *typica* but that the females do not differ in size from that race. The possibility should be mentioned that if the type is a young bird, its short wing and restricted abdominal markings may be due to immaturity, for these are also characteristics of an immature *typica* (UMMZ 132541). The wings of the other two males seem not quite as short as that of the type but are barely shorter than those of the smallest *typica*, as are their culmens. The rather short wing measurement leaves the tail longer than the wing in males, the reverse of the usual situation in *typica*. If the birds from the Department of Córdoba are considered *minor* and not intergrades, the race is still distinguishable on the basis of color characters.

In any case, the differences between *minor* and *typica* appear to me to be slight, and a larger series of the former in fresh plumage may show them to be even slighter than they seem at present.

The range of *minor* as presently known is not in contact with that of the other South American forms. The distributional gaps will surely be largely filled in by further collecting, but it is possible that *minor*, inhabiting the tropical lowlands of extreme northwestern South America, is more effectively isolated by mountain barriers from other subspecies than it is from *typica*. If so, this could explain why the characters of *minor* apparently do not form a bridge between *typica* and the other South American subspecies; instead, *minor* resembles *typica* more closely than it does the others.

The wide South American distribution of *Deconychura longicauda* indicates that it originated on that continent and that it has expanded northward into the humid tropical lowlands of Central America. As is well known to students of neotropical zoogeography, many avian species of southern origin range no farther north than the extensive lowlands of eastern Nicaragua. The fact that *Deconychura longicauda* occurs in the extreme northern portion of that area suggests that the species may be even more widely distributed along the Caribbean slope of Central America and may possibly still be expanding its range

to the north. In the event that new specimens are obtained outside the presently known range, it is hoped that the great variability of the species as evidenced by a large series will be seriously considered before nomenclatural action is taken.

Summary.—Variation in size and color was studied in 38 specimens of the Long-tailed Woodcreeper (*Deconychura longicauda*) from Central America and Colombia. The subspecies *typica* was found to range from the Caribbean slope of northern Nicaragua south to extreme northwestern Colombia; the race *darienensis* is not considered separable from *typica*. *Typica* appears to intergrade with the Colombian race *minor* at the western part of the range of the latter. Considerable uncorrelated variation in size and color is shown in both forms, and additional material may alter the taxonomic picture.

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EFFECTS OF DDT, TOXAPHENE, AND DIELDRIN ON PHEASANT REPRODUCTION

BY RICHARD E. GENELLY AND ROBERT L. RUDD

AGRICULTURAL control chemicals of high toxicity are being applied in greater quantity every year. New chemicals are being developed and frequently appear on the market. Under these conditions, it is apparent that the potential hazard to wildlife species is increasing rapidly. Despite extensive studies carried on by the U. S. Fish and Wildlife Service and other agencies during the past decade, great gaps remain in our knowledge of chemical-wildlife relationships. One such gap is the effect of one or a series of chemicals on the reproductive capacity of an animal. Population declines may be brought about by an increase in the mortality rate or by a decline in the birth rate. A number of dead animals found in a treated area may indicate an increase in mortality, but the signs of a decrease in birth rate are far less obvious. Despite the lack of clear evidence for reproductive suppression under field conditions, experimental work with the fowl (Rubin et al., 1947) strongly suggests that these effects occur and warrant careful investigation.

It was the purpose of the present study to determine the relative impact of insecticide intake on four phases of pheasant reproduction—egg production, fertility, hatchability, and survival of young. Three chlorinated hydrocarbon insecticides commonly used in California—DDT, toxaphene, and dieldrin—were selected for study. Ring-necked Pheasants (*Phasianus colchicus*) raised on the State Game Farm at Yountville, California, were used as experimental animals.

EXPERIMENTAL CONDITIONS

Feeding tests were conducted with female pheasants in the fall and winter of 1953 to determine the chronic toxicity of each chemical (Genelly and Rudd, 1956). Two "sublethal" levels for each chemical based on the outcome of these trials were selected for the reproductive studies (Table 1). Previously untreated pheasants were segregated into 12 breeding subgroups, each consisting of one male and ten females. Two subgroups were fed at the higher sublethal level for each insecticide and a single subgroup at the lower level. Three subgroups were maintained as controls. Each subgroup of pheasants occupied a single breeding pen.

The principal food given to all birds was a high protein mash (commercial "Turkey grower") in pellet form. Fifty-pound lots of the mash were mixed with the appropriate quantity of insecticide. The

TABLE 1

EGG PRODUCTION, FERTILITY, AND HATCHABILITY

p.p.m. in mash	*Hen days*	*Eggs laid*	*Laying rate (eggs/♀/day)*	*Eggs incubated*	*Eggs fertile*	*Fertility (per cent)*	*Young hatched*	*Hatchability (per cent)*
DDT								
100	580	395	.681	282	256	90.8	189	73.8
400	1020	698	.684	525	472	89.9	310	65.7
Toxaphene								
100	459	333	.725	251	211	84.1	170	80.6
300	918	436	.475*	337	297	88.1	165	55.6*
Dieldrin								
25	490	326	.598*	215	208	96.7	145	69.7
50	1020	556	.545*	454	346	76.2*	269	77.7
Control								
0	1470	1047	.712	785	717	91.3	570	79.5

* Differs significantly from control at 5 per cent level.

TABLE 2

FOOD CONSUMPTION, INSECTICIDE INTAKE, AND WEIGHT CHANGES OF PHEASANTS DURING THE REPRODUCTIVE PERIOD

Concentration of chemical p.p.m. in mash	*in total diet*	*Mean daily consumption bird/day mash, gm.*	*chem., mg.*	*Mean live weight change of females (gm.)*
DDT				
100	90	57.2	5.72	+20
400	355	52.1	20.84	−20
Toxaphene				
100	89	47.4	4.74	+9
300	243	30.4	9.12	−62
Dieldrin				
25	22	44.6	1.12	−14
50	42	36.6	1.83	−36
Control				
0	0	51.6	0	+64

storage of the food within each pen made it possible to determine the amount of food consumed by each group and to equate this into the mean rate of consumption (Table 2). Stores of contaminated food were renewed midway through the test period. The amount fed daily was commensurate with the amount consumed. Uncontaminated scratch grain, in measured amounts, was substituted when rainy weather threatened pellet disintegration; hence the insecticide concentration of the "total diet" (Table 2) differs from that of the mash. Oyster shell was fed to all groups to aid in shell formation.

For convenience, the insecticide concentration of the mash has been used to denote the pheasant groups in the figures (Figures 1–4).

Egg-laying began two weeks after the inception of the tests and continued through the remainder of the period. The eggs were gathered twice daily, dated, identified as to group, and stored in a cool room until set. Storage of the eggs was from one to seven days with one exception: eggs laid during the first week were stored up to 14 days. Eggs with soft, chalky, or cracked shells were checked for fertility (Twining *et al.*, 1948) but were not incubated; hence the hatchability samples (Table 1) have relative rather than absolute value.

Artificial incubation of the first group of eggs began in the last week of April, 1954. The eggs from the controls and from each test group of females were separated within the incubator. Routine handling of eggs thereafter was in accordance with accepted game-farm practice. Candling of all eggs on the eighteenth day resulted in the elimination of those in which development was arrested. These eggs were opened later to determine fertility and the extent of development. All eggs possessing developing embryos were transferred from incubator to hatching compartments on the day before hatching.

Soon after hatching the chicks were toe-clipped for later identification, sexed by the pattern of the facial down (Latham, 1951), and transferred to a battery brooder. Feeding and care of the birds for the ensuing two weeks was identical to that normally accorded other pheasant young. Most of the young were destroyed at two weeks of age. However, all young from eggs last-incubated were maintained for two months.

EXPERIMENTAL RESULTS

Egg Production.—The mean rate of egg-laying was calculated for each group, since it was not feasible to determine the egg production of individual females. The "laying period" for each group was considered to begin with the appearance of the first egg and ended on May 13. The number of "hen-days" for each group is the product of the "laying period," in days, and the number of females present.

Weekly rates of egg production (Figure 1) reflect differences in egg-laying trends of the various test groups. DDT, fed at both levels, resulted in weekly rates very similar to and often in excess of those of the controls. Toxaphene fed at 100 p.p.m. markedly depressed laying from the fourth week. Dieldrin at 25 p.p.m. depressed egg laying slightly below that of the controls, but at 50 p.p.m. it, too, significantly lowered production during the last five weeks.

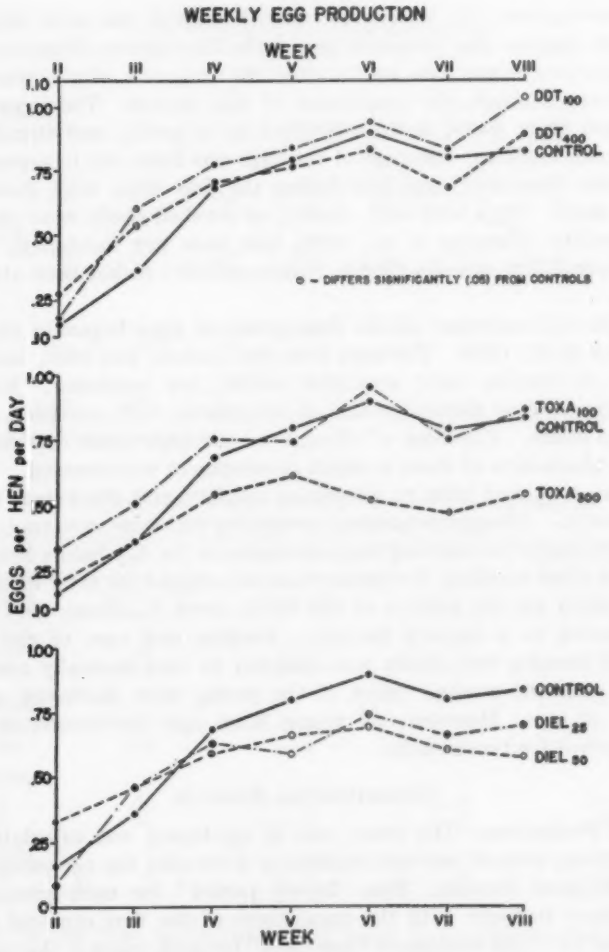

FIGURE 1. Weekly egg production.

With each chemical, the effect on egg-laying seemed to be proportional to the level of chemical intake.

The overall rate of egg production for each group (Table 1) reflects the weekly trends. Egg-laying was significantly depressed in the pheasants consuming 300 p.p.m. of toxaphene and either 25 p.p.m. or 50 p.p.m. of dieldrin.

The mode of action of the insecticides in reducing egg production is suggested by Figure 2. There appears to be a direct relationship between the amount of food consumed by the birds and the number of eggs laid. The aversion of Bobwhite Quail (*Colinus virginianus*) for food treated with insecticide has been noted by other investigators (Linduska and Springer, 1951). In acceptance tests, food treated with DDT was eaten almost as readily as untreated food, but food containing toxaphene usually was rejected. In similar tests lindane-treated food has been rejected by pheasants (Rudd and Genelly, 1954). It appears, therefore, that the reduced egg production of

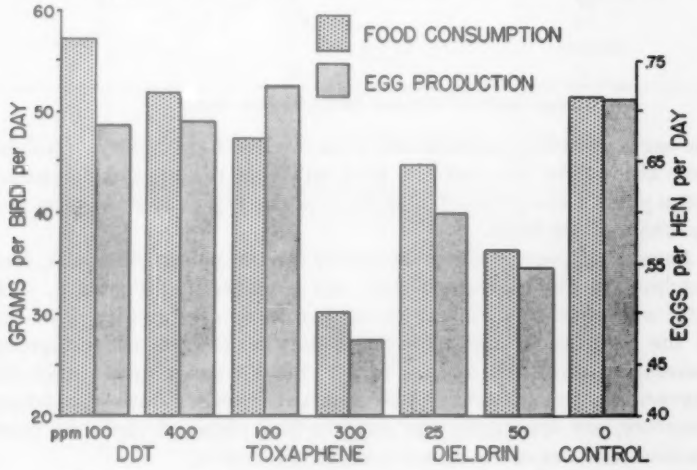

FIGURE 2. Relationship of egg production to food consumption.

the pheasants on dieldrin and 300 p.p.m. of toxaphene is due primarily to an aversion of the birds for the treated food.

Egg Fertility and Hatchability.—Fertility and hatchability varied with each chemical and concentration (Table 1). Moreover, the degree of effect was not related consistently to the level of chemical intake (Table 2). Only the effects of 50 p.p.m. of dieldrin on fertility and of 300 p.p.m. of toxaphene on hatchability are of statistical significance. Egg fertility might be lowered by physiological disturbance of the male, the female, or both. The male's role in lowering egg fertility, however, was suggested by the behavior and death of males consuming 50 p.p.m. of dieldrin.

The variability of the insecticide concentration in the eggs from each group (Table 3) suggests that the presence of the chemical within

TABLE 3

INSECTICIDE CONCENTRATION IN EGGS

p.p.m. of chemical in total diet	p.p.m. of chemical in eggs	Number of eggs tested*
DDT		
90	162	2
355	349	4
Toxaphene		
89	54	2
243	56	4
Dieldrin		
22	3	2
42	193	3
Control		
0	0	4

*All eggs analyzed were laid during the final week.

the egg is not solely responsible for the lowered hatchability. Judging from the weight loss and low food intake of the females consuming 300 p.p.m. of toxaphene (Table 2), it seems rather to reflect the poor condition of the birds.

Survival of young.—Survival curves for the young pheasants, from hatching to the thirteenth day, are presented in Figure 3. The total mortality of each test group is significantly greater than that of the controls for that period. Young birds from all test groups maintained until two months of age did not suffer undue mortality beyond the second week. The first two weeks following hatching, therefore, are apparently the most critical phase of pheasant reproduction with respect to insecticide contamination.

Reproductive Success.—The survival curves in Figure 4 were constructed to show the net effect on pheasant reproduction of each chemical concentration. The number of eggs produced by ten females in 30 days at the mean laying rate of each group (Table 1) is the basis for the hypothetical starting point. A decline in the laying rate of females, under field conditions, almost certainly would not reduce clutch size; rather it would delay completion of the clutch. For this reason, relative reproductive success (Figure 4) does not include the marked differences in egg production—young pheasants from 70 per cent of the control eggs were alive at the end of the test period.

As might be expected, the higher concentration of each chemical depressed reproductive success to the greater degree. DDT and toxaphene at comparable levels had similar effects. Dieldrin at considerably lower concentrations had slightly greater effects.

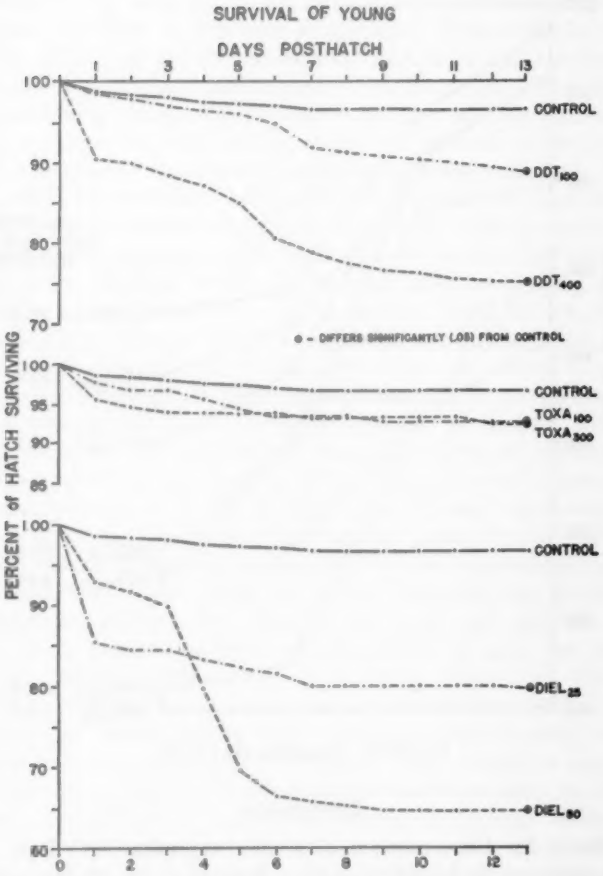

FIGURE 3. Survival of young.

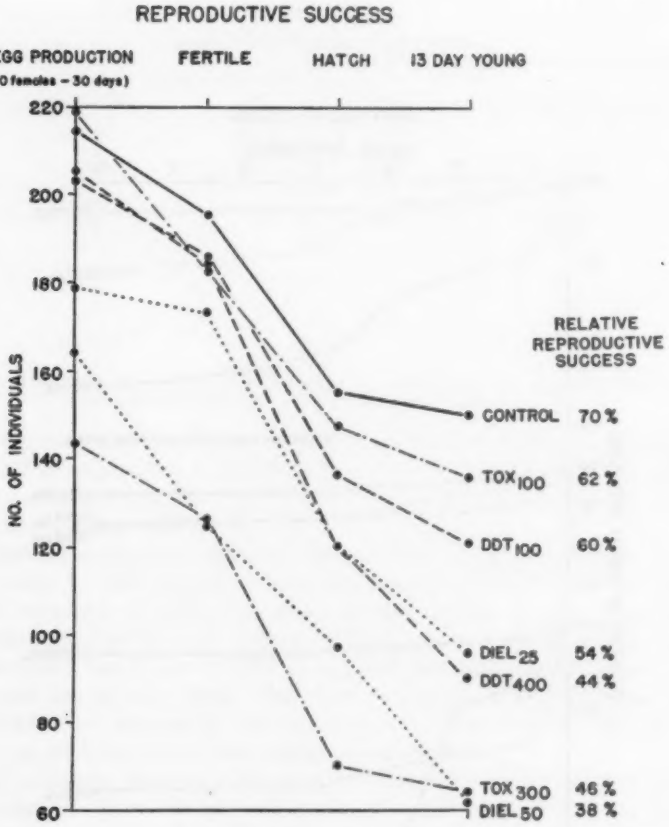

FIGURE 4. Reproductive success.

DISCUSSION

Evidence for the existence of similar reproductive effects under field conditions is largely lacking. However, the finding of dead birds in areas heavily treated with insecticide suggests the possibility of an effect upon the reproduction of birds that ingest sublethal quantities. In the orchards of Washington and British Columbia, DDT is applied at rates that may total 40 to 60 pounds per acre per year to control insect pests. Other insecticides, such as parathion and sulphenone, frequently are used on the same crops during the same season. Considerable mortality of ground-dwelling birds has

been reported (Mohr et al., 1951; Barnett, 1950) in these treated areas, but apparently there has been no noticeable decline in the reproductive success of the species concerned. In the rice fields of California, the use of DDT-coated seed rice in 1953 was responsible for some mortality of breeding Ring-necked Pheasants (Rudd and Genelly, 1955), but overall reproductive success was higher that year than it had been in the previous year (C. M. Hart, 1954, pers. comm.).

Despite these reports the possibility remains that more susceptible species of restricted distribution might be seriously threatened by continued exposure to sublethal quantities of these chemicals. Single applications of insecticide frequently are of sufficient magnitude to deposit chemical residues (Laakso and Johnson, 1949; Barnett, 1950) equivalent to or in excess of the highest levels used in the tests. Although these residues decline in toxicity with weathering, several applications may be made in a single season. Wild birds would not be exposed to a constant level of contamination in their diets, as the pheasants were in the experiments, but rather to a series of sudden increases and gradual declines in the toxic content of their food supply. At first glance, this would seem to decrease the hazard; however, there is evidence that intermittent feeding of birds on contaminated diets may result in more severe effects than continuous feeding, at the same level (J. B. DeWitt, 1954, pers. comm.); moreover, wild birds at the time the chemical is applied might be contaminated by three routes of chemical entry: oral, by the ingestion of contaminated food; dermal, by absorption through the skin; and respiratory, by absorption through the lining of the lungs and air sacs. The penned birds were subjected to contamination by only one route—the oral. Although this portal is generally considered the most important in toxicological investigations, insufficient attention has been given to effects derived from multiple routes of entry such as might be expected under field conditions. Field studies to date have been concerned chiefly with acute mortality and immediate population declines. Population reduction in chemically-treated areas may result from direct mortality, movement from the area necessitated by a reduced food supply, and by impairment of reproduction. In most instances it is difficult to assess the relative importance of each factor in effecting a population decline. Although no one can state with finality that reproductive effects exist, on the basis of our experimental work we can state that chemicals at levels commonly used in agricultural practice can seriously affect reproductive behavior. Furthermore, similar chemicals may induce differential and often subtle responses of types frequently overlooked in field studies.

SUMMARY

Experiments were carried on at Yountville, California, in 1954, to determine the effects of insecticide-contaminated diets on reproduction of the Ring-necked Pheasant. Breeding groups of game-farm birds were fed varying levels of three insecticides—DDT, toxaphene, or dieldrin. Each group was compared with the control for egg production, fertility, hatchability, and survival of young.

Egg production was depressed significantly in the groups fed 300 p.p.m. of toxaphene and either 25 p.p.m. or 50 p.p.m. of dieldrin. There appeared to be a direct correlation between food consumption and egg production in all groups.

Egg fertility of the 50 p.p.m. dieldrin group and the hatchability of the eggs from the 300 p.p.m. toxaphene group were significantly lower than in the control. The lowered hatchability was associated with poor condition of the adult females rather than with the concentration of the insecticides within the eggs.

Mortality of young in each test group was significantly greater than that of controls for the first two weeks. From the second through the eighth week of age, survival of young did not differ appreciably between test and control groups.

Reproductive success ranged from 70 per cent in the control group to 38 per cent in the 50 p.p.m. dieldrin group. The higher concentration of each chemical had the greater net effect on reproduction.

Evidence of the relative importance of reproductive effects in reducing wild bird populations is lacking. However, insecticide levels similar to or in excess of those used in this study are of common occurrence in agricultural areas. Furthermore, wild birds are exposed to a greater contamination hazard, by aerial spraying, than the test birds.

ACKNOWLEDGEMENTS

The authors wish to express their gratitude to a number of persons for their assistance. The personnel of the State Game Farm at Yountville, California, and in particular Frank James, performed the routine tasks of pheasant care and maintenance. E. C. Carlson of the University Insectary at Davis made equipment available for feed treatment. H. Edward Bond, under the supervision of Dr. S. Anderson Peoples of the School of Veterinary Medicine, performed the chemical analyses. Statistical treatment of the data was provided by Mary B. Smith.

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THE SAGE HEN IN WASHINGTON STATE

BY CHARLES F. YOCOM

History.—Ballou (1938) mentions a sage cock shot at the head of Pine Creek, Klickitat County, probably in May of 1872. He also mentions that the Sage Hen (*Centrocercus urophasianus*) was in the Alder Creek country and Horse Heaven sand hills (p. 171) from 1840 to 1900.

Lewis and Clark party on October 17, 1805, saw a great number of grouse that were larger than Heath Hens near the mouth of the Snake River and several were shot (Quaife, 1916). Douglas (Royal Historical Society, 1914) also mentions seeing this bird on the sagebrush plains of eastern Washington.

Apparently Sage Hens were common from October to April along the Columbia River from the junction of the Spokane River to the mouth of the Walla Walla River. Douglas (Royal Historical Society, 1914) saw large numbers of these birds at Priest Rapids. He indicated that these birds moved back from the lowlands along the rivers to nest in the arid highlands.

Range of the Sage Hen.—This interesting grouse of the semi-desert lands of eastern Washington formerly ranged from the lower section of the Columbia River Valley that was covered with the Artemisia-Agropyron vegetative complex, north along the Columbia River to the Big Bend Country and still northward along the Okanogan River Valley to the Boundary of Canada at Oroville. Sage Hens also were known to have inhabited the dry sage brush flats of the Okanogan Valley in British Columbia. This species also was common in the Yakima Valley and the vast sage-covered lands that lay between this watershed and the Columbia River. Probably the range of this bird did not extend much farther northeastward along the Columbia River than Miles, near the mouth of the Spokane River. It is also unlikely that many Sage Hens formerly were present in Spokane County, except along the west side. Jewett *et al.* (1953) present information showing that Sage Grouse were formerly hunted in Spokane County. Accounts of early days in western Whitman County indicate that these birds were occasionally abundant in some areas. Areas bordering the Walla Walla and Touchet rivers supported these birds, and Jewett *et al.* (1953) point out that these birds formerly were in Columbia County. The lands along the lower Palouse River and the Snake River southwest from its confluence with the Palouse formerly supported Sage Grouse.

The bulk of the populations, however, must have been confined

to the vast sagebrush lands of the Big Bend, Moses Coulee, Grand Coulee, and Crab Creek drainage southward to the Snake and Columbia rivers. This large area includes Douglas, Grant, Lincoln, Adams, and Franklin counties. Also many Sage Hens must have lived along the dry east slopes of the Cascade Mountains and the sage flats bordering the Yakima River, its tributaries, and the Columbia River in the counties of Kittitas, Yakima, Benton, and Klickitat (Figure 1).

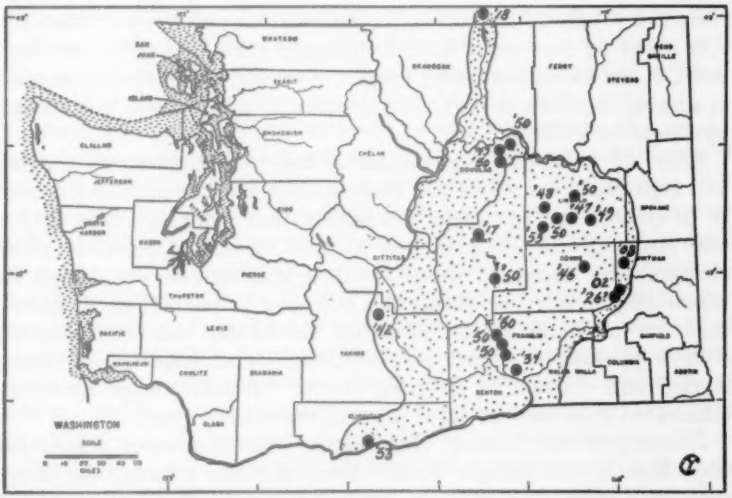


FIGURE 1.—Range of Sage Hen in Washington State; dots represent records of grouse seen in the year indicated.

According to the vegetative zones established by Daubenmire (1942) for southeastern Washington and adjacent Idaho, Sage Hens formerly were restricted to the Artemisia-Agropyron zone for the most part. Some birds lived in the lands classified as formerly in the Agropyron-Poa climax zone in western Whitman, southeastern Adams, eastern Franklin and Walla Walla counties, and part of Columbia County. This classification does not mean that Artemisia was entirely lacking in this zone; formerly some valleys in the counties mentioned had considerable sage in them, thus Sage Hens could have done well in some areas included in this Agropyron-Poa zone. For example, large sage plants still persist along the Palouse River in Whitman County approximately three miles northeast of Palouse Falls.

Land Changes.—Obviously land-use has had much to do with the gradual elimination of Sage Hens from their former ranges. Overgrazing of grasslands during the cattle and sheep era may have had a depressive effect on population levels, but the greatest changes started with the plowing of the range lands and burning of sagebrush lands. In many areas Sage Hens were eliminated in a similar manner to Sharp-tailed Grouse (*Pedioecetes phasianellus*) because the space requirement could not be met (Yocom, 1952). Scabland channels remained relatively untouched for many years and some of them are still about as they must have been many years ago. The development of the Columbia Basin Project, however, eliminated thousands of acres of sage flats in the Grand Coulee and now much of it is flooded by irrigation waters.

Since World War II, large machinery has made it physically possible and high prices for wheat has made it economically possible for land to be cleared and put under cultivation that was range land only a few years ago in Douglas and Lincoln counties. Some of these changes have happened within the last year or two, and it will be noteworthy to see what effects this will have on populations of grouse that are in those areas. Most of the former sagebrush-covered valleys of western Adams and southern Grant counties are being leveled and planted to irrigated crops. Obviously Sage Hens are eliminated from most of these areas at the present time.

Hunting in the State of Washington.—The first open season for Sage Hen in the Badger Pocket Area, Kittitas County, for many years was established on October 8 and 9, 1950. The limit consisted of one bird per day and one bird per season. The bag limit has remained the same. The area has been increased for the hunting of this species as indicated by the following table concerning dates of seasons and areas open to hunting:

TABLE 1

SAGE HEN HUNTING SEASONS AND AREAS OPEN TO HUNTING

Year	*Dates*	*Area open to hunting by counties*	*Number killed*
1950	October 8 and 9	Badger Pocket, Kittitas County	1,500–2,000
1952	October 7 and 8	Badger Pocket, Kittitas County Grant and Douglas counties	2,400
1952	October 7 and 8	Kittitas, Grant, and Douglas counties	3,900
1953*	October	Kittitas, Grant, Douglas, and Yakima counties	4,000

* Season was opened on Sharp-tailed Grouse in Douglas, Lincoln, and Okanogan counties, the first hunting season on this species for many years.

The number of birds harvested the first season was estimated to have been from 1,500 to 2,000 birds. Returns from hunter kill questionnaires sent out by the State of Washington Department of Game indicated that approximately 2,400 Sage Grouse were harvested in 1951; 3,900 in 1952; and 4,000 in 1953 (data furnished by Raleigh Moreland, Assistant Chief Game Management Division).

Many people might consider a season on a species that was being eliminated from its former range as undesirable, but we must remember that most species of upland game are usually at a population level commensurate with the range that they are in; in other words, they are at a population level that is compatible with the existing environmental factors that control the carrying capacity of the range.

Obviously the yearly production of these grouse results in a surplus population in the fall that should be harvested by the hunters and not left for other decimating factors to reduce to the normal level of the breeding stock on the range as it now exists. Closed seasons will not assure populations of Sage Hen for future gunners and students of nature; what should be done is to assure proper environments for these birds for future years. The danger in losing this attractive native grouse is related to the elimination of the large sections of sage and grasslands. Land-use practices more than any other development will determine the fate of this bird in Washington; and these, of course, are fundamentally tied in with the economics of the State. We know that the range lands are gradually being reduced, and we know that the Sage Hen will fade from our western scene as the large communities of sagebrush and other plant associates are eliminated. There is a good chance that the sagebrush lands controlled by General Electric along the Columbia River in Benton County will act as a refuge for this species for some time to come. Also there may be relatively undisturbed range lands in the channeled scablands of Lincoln, Grant, and Douglas counties that will be extensive enough to hold this species in future years. However, human populations are growing rapidly in central Washington as a result of the Columbia River Basin Development Program, and future demands for land will become greater, so it is difficult to say what may be the fate of this grouse in Washington.

Raleigh Moreland, Assistant Chief of the Game Management Division of the State of Washington Department of Game, feels that Sage Hen populations will increase as the Columbia Basin is developed in response to increased water and food supplies. Apparently farming increased Sage Hen populations in the Badger Pocket area, and there are indications that other populations have

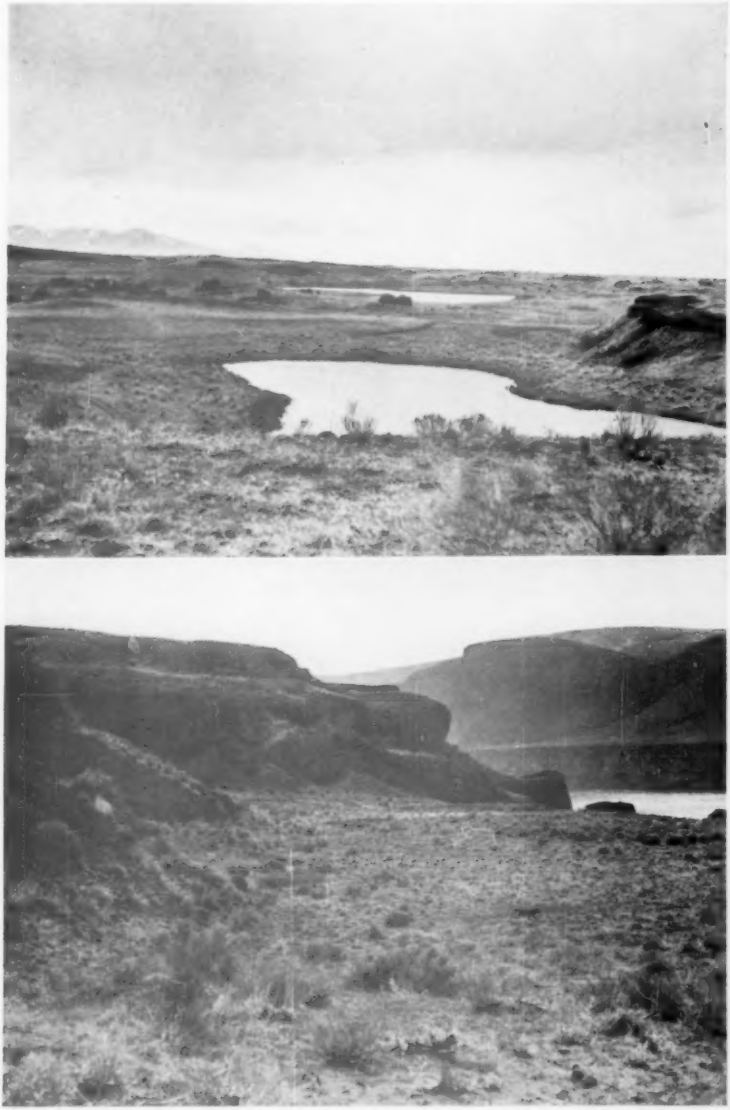
spread into habitat that was void of grouse twenty-five to forty years ago.

Breaking of some of the sagebrush lands for agricultural use may actually increase Sage Hen populations to a certain point. However, continued elimination of native range lands undoubtedly have a depressive effect after a certain ratio of "wild" land to crop land is reached.

Population Levels.—From all indications, population levels in Washington have increased markedly on the better range for this species within recent years. On the other hand, we know that other populations on marginal areas have been reduced or entirely eliminated since 1900 owing to land use. In the Badger Pocket Area of Kittitas County, the Sage Hen increased to the point that they were causing damage to alfalfa and potatoes prior to the first open season. In this case the lands in the valley are used to produce agricultural crops and are surrounded by extensive sagebrush range lands on the highlands which make ideal conditions for Sage Grouse. The first season in Badger Pocket produced about 2,000 birds, so it is obvious that many birds were in this relatively small area of about ten townships. The kill for this restricted area for the succeeding years is not available since other areas were opened for hunting of Sage Hens and the hunter's take is on the basis of total kill for the State. The populations appear to be holding up well under the present hunting pressure, however.

Migration.—Studies by Patterson (1952: 198) show that Sage Hens migrate considerable distances in the intermountain areas of western Wyoming; birds move from 50 to 100 miles from their breeding ranges to winter ranges at lower elevations. Batterson and Morse (1948) felt that Sage Hens were semi-migratory in Oregon, moving to lower elevations to breed and nest, and then moving to higher elevations during the summer months to return to lower elevations with the advent of winter.

Apparently Sage Hens in Washington do not migrate long distances at the present time. Writings by Douglas (Royal Historical Society, 1914) in 1827, however, indicate that these birds congregated in large flocks along the Columbia River between the junctions of the Spokane and the Walla Walla rivers from October to April. They were apparently abundant near Priest Rapids where he saw them in groups displaying. In August he mentions flushing large flocks of young birds near Grand Coulee, but he mentions that Sage Hens are seldom seen near the banks of the river at this time of year. Such remarks indicate that there was noticeable movement of the birds to the lower country during the winter months.



SAGE HEN RANGE IN WASHINGTON: Upper picture is of Douglas County northeast of Delrio; Lower picture is of range along the Grand Coulee.

In 1947 Ralph King, rancher near Sylvan Lake, Lincoln County, stated that he saw Sage Hens on his ranch during the winter but did not see them during the summer. Records for this county indicate that birds in his area move north towards Crescent Butte during the summer.

Ben Starkel, a rancher near Delrio, Douglas County, in an interview, states that he believed that Sage Hens in the high country of this county migrated south to the Moses Coulee area during the winter months. He has lived in this area for many years so he would notice the absence of these birds during winter months. Migration from the high range lands near Delrio to the Moses Coulee area would involve movements of as much as 30 miles.

Former and Present Status by Counties.—Thanks to the encouragement of Stanley Jewett, I have attempted to evaluate the present status of this grouse throughout its range in eastern Washington. Many of the records presented here are those of other people and are indicated in each case. Waterfowl surveys financed by the State of Washington Department of Game and research funds furnished by the State College of Washington have made it possible for me to cover all of the former range of the Sage Hen many times from 1940 to 1953. The records are presented by counties as a matter of convenience; some of the more important observations are indicated on a map by means of a dot with corresponding date by year (Figure 1).

Formerly the range of the Sage Hen closely followed the sagebrush associations in Washington and extended from the lowlands of the Columbia River Valley bordering on Oregon northward to the Canadian line via the Okanogan Valley. Counties included from north to south and from west to east were: Okanogan, Douglas, Grant, Lincoln, Chelan bordering the Columbia River, possibly the south edge of Ferry and Stevens counties along the Columbia River, western edge of Spokane, Kittitas, Adams, western edge of Whitman, east of Yakima, Benton, Franklin, western part of Walla Walla, and parts of Klickitat. Figure 1 shows the approximate former boundary of the Sage Hen range and indicates records for this species by years.

Okanogan County.—Old timers in the Oroville area mention shooting Sage Grouse in the sage covered terraces along the Okanogan River soon after the turn of the century. W. J. Ripley, a prospector who worked extensively in mountains bordering the Okanogan Valley in Washington and British Columbia, Canada, claims to have shot the last Sage Hen that he saw in that area in 1918 near Oliver, British Columbia, a town 14 miles north of the International Border. No recent records are available from this area.

Ferry and Steven counties.—I have no recent records for this species in these counties, but accounts by Douglas (Royal Historical Society, 1914) indicate that Sage

Grouse were found along the shores of the Columbia River in the southern parts of these counties in the early days.

Chelan County.—Suitable areas for these birds existed along the south shore of Lake Chelan, hillsides bordering the Columbia, and the southeastern corner of this county, so it is assumed these birds were found here in the early days although there are no available records for the specific areas.

Douglas County.—Much sage still remains in this county; many small lakes and potholes provide plenty of water and it is on these range lands where Sage Hens, Sharp-tailed Grouse (Yocom, 1952) and waterfowl (Yocom, 1951) breed in considerable numbers. Some of the records for Sage Hens are as follows: Three adult grouse flushed from a sagebrush hillside about six miles northeast of Delrio at 6:45 A.M. (Yocom and H. A. Hansen) July 26, 1950. According to W. W. Stevenson, local rancher in this area, two flocks of Sage Hens (consisting of about 80 birds in each flock) were seen on the Rice and Stevenson ranches during the fall of 1949. There is a high ridge running through this area and much of it was unbroken sagebrush-grassland association; the land that was farmed was in wheat and fallow. Stevenson mentioned that the grouse do not winter in this high country.

On July 26, 1950, six were seen six miles southeast of Delrio by Hansen. Early the next morning a female and three young birds that could fly flushed from sagebrush range land seven miles northeast of Leahy; nearly a mile north of this location a female with one young about half grown flushed from the road; three large males flew from sagebrush land near the road (Yocom).

The large expanses of sage associations in this county in the higher ranges that are used in the summer and the lower areas in the southern part of the county that are used possibly at all times of the year by some of the population and more in the winter by birds from the northern part of the range make this one of the more important centers in the state for this species. Unless the sage communities are destroyed soon there should be huntable populations of Sage Hens in this county for some time.

Grant County.—Formerly this county supported many grouse; the Columbia Basin Reclamation Project, however, caused the destruction of much of the original sage lands. The upper Grand Coulee was cleared then flooded by the formation of the 27-mile-long equalizing reservoir and thousands of fertile sage-covered lands have been cleared for agricultural use under the irrigation type of farming.

Much sage land still occurs in the "scablands" bordering both sides of the Grand Coulee; many grouse are found locally in the Beezely Hills northwest of Ephrata (Hudson and Yocom, 1954), and grouse have been reported on the east side of the Grand Coulee in range lands. Harris and Yocom (1952) have two records for the potholes south of Moses Lake; two seen on June 8, and one seen August 22, 1950. Much of the potholes area has been flooded by O'Sullivan Dam.

According to Charles Swanson (Swanson, 1946) Sage Grouse were very common in 1915, 1916, and 1917 near Adrion. He estimated that there were about seven or eight nesting females on his 80 acres. He states that these birds feed exclusively on wild sunflowers from midsummer on.

Because of changes in agricultural use of the land, Grant County may never support many Sage Hens except in localized areas.

Lincoln County.—Nearly half of the land in Lincoln County was classified as range land as late as 1950. The headwaters of Crab Creek and its tributaries, for the most part, are located in this county; glaciers and glacial waters in the past cut many channels and exposed much basalt which makes much of the land unsuitable for

tilling. Dry wheat ranches are restricted to the fertile windblown soils that lie between the channeled areas. This creates edge effects between sage-grass associations and farm lands. The richer, more accessible lands, of course, have been exploited, and this factor may account for reductions in populations for the area as a whole for rich soils produce more game birds per acre.

Andrew and Joe Long have lived on a ranch in Lake Creek Channel located west of Herrington since 1926. Many Sharp-tailed Grouse winter on their property in severe winters and they feel that this species has increased. They feel, however, that Sage Hen populations in their area have decreased within recent years. Fifteen Sage Hens were seen in one flock on their range during the fall of 1949. The neighboring ranch to the west also supports these birds (Ralph King).

Areas that support Sage Hens at present are: Hawk Creek, breaks of Bachelor Prairie, North Telford Area, Lake Creek Area, and Connawa Area (C. V. Fisher, former game protector of Lincoln County). All of these areas support sagebrush and are well watered. The North Telford area is a plateau of sagebrush and some yellow pine, dissected by a few draws; potholes are scattered over the area. The Connawa Area probably has the most Sage Hens of any area in the county.

Other records are: Two adults and four young over one-fourth grown near "H" Lake south of Wilbur, July 27, 1948 (H. A. Hansen); ten south of Creston Butte, July 23, 1949 (Hansen and Don Galbreath); two adults and one young flushed from road south of Creston Butte, July 25, 1950 (Yocom); two flushed from road south of Milan Hollow, Section 26T24N, August 2, 1950 (Yocom); four adults two miles southwest of Will's Lake, August 2, 1950 (Hansen); nest successfully hatched (9 egg caps) under *Artemisia tridentata* 25 feet from fence in a pastured area about ten miles northeast of Marlin, June 17, 1953 (Paul Johnsgard and Yocom).

Spokane County.—There are no recent records from this county, but Jewett, *et al.* (1953) and accounts of old hunters indicate that Sage Hens were hunted along the western border south of the Spokane River and in the southwest corner. Most of the land that formerly supported this species has been plowed for many years.

Kittitas County.—The first open season on this species for many years was in the Badger Pocket area in 1950. Nearly 2,000 birds were harvested from the southeast corner of this county in an area consisting of approximately ten townships. For hunting purposes the area was defined as that part of Kittitas County south of the Ellensburg-Vantage Highway and east of the Ellensburg-Yakima Highway. Actually Badger Pocket area is a large flat formed by the foothills of the Wenatchee Mountains to the north, northeast, and east, and by the Umtanum Ridge to the southwest and south; the high country is utilized as grazing land and the lowlands are farmed. Elevations are under 4,000 feet for the most part and the vegetative associations include sage (*Artemisia tridentata*), thus furnishing the requirements of good Sage Hen range. Other small populations of Sage Hens may be found in other parts of this county.

Yakima County.—Approximately the eastern half of this large county was formerly suitable for Sage Hens; the Artemisia-Agropyron associations developed under minimum rainfall owing to the rainshadow effect of the Cascade Mountains directly to the west; several large ridges cross the county from northwest to southeast such as the Ahtanum, Yakima, and Rattle Snake ridges east of the Yakima Valley. Large sagebrush valleys were abundant; now some of them including the Yakima Valley are highly agriculturalized as a result of reclamation projects. John B. Hurley, ornithologist from Yakima, has summarized Sage Grouse conditions in this county (some of his information was obtained from Wallace Kramer).

"The Sage Grouse shows all indications, in this county, of holding its own, and perhaps even showing a slight increase, though not as numerous as 20 years ago. For the past 10 years these birds have remained about the same. They are partial to certain areas, and a small flock can usually be noted if one takes the time and energy to look for them.

"Last year (1953), there was an open season on these grouse in this county, with a daily bag and a season limit of one (1) bird, which the State Game Department felt was justified, as there were sufficient birds for such an open season. The kill was not heavy during this open season, as most hunters prefer to hunt other, and easier to find, game birds. Hunting with dogs is not extensive in this country, which is another factor that cuts down the number of hunters looking for them.

"There has been very little change in the range of the Sage Grouse in this county and what change has occurred has not affected the grouse population in the least. Some of the sagebrush land has come under marginal irrigation, while some sections have been cleared for dry farming, but the percentage of such has been too small to even consider. There still remain extensive sections of miles of sage brush where these grouse live and as there seems to be little chance that there will be any change in such habitats, there is good reason to believe that with proper protection these grouse will continue to hold their own.

"Loss by predators is a small factor—Road kills by autos are so very rare that they do not warrant consideration."

On December 15, 1942, four birds were flushed from a broad, sagebrush-covered valley high upon a ridge facing the southeast, between the Naches and Tieton River Valley on what is now the Oak Creek State Game Range (Yocom). Seven Chukar Partridges and Hungarian Partridges were also flushed from the top of this same ridge.

Comments for hunters interested in Sage Hens in District 4 which includes Kittitas, Yakima, and western Benton counties (Anon., 1953: 5) point out some of the population centers:

"A good population (of Sage Grouse) in Yakima and Kittitas counties where areas are open. Best areas are Yakima Firing Center, Badger Pocket, Quilomene, Brushy cannon, Whiskey Dick, and Skookumchuck canyon regions."

Klickitat County.—Present status of Sage Hens in this county has been summarized by Raymond W. Meyer, District Conservationist at Goldendale (letter, 1954):

"Sage Grouse are regularly seen in that portion of Klickitat County east of Rock Creek (approximately eastern one-third of the county) and south of the timbered slopes of the Simcoe Mountains. This area is a wheat-range country. Sage Grouse are quite common in the eastern portion which is predominantly bunch grass and sage brush. The species occurs in lesser numbers in the western portion.

"This species is also seen occasionally along the area between the Columbia River and the cropland at the lower edge of the Columbia Hills. They are also seen in the Goodnoe area occasionally.

"Two birds of the species were seen in April of this year approximately eight miles southeast of Goldendale along the north slope of the Columbia Hills.

"Sage Grouse do not occur abundantly in Klickitat County but are not uncommon in sage-bunchgrass areas where a relatively small portion of the land is tilled. They seem to occur in an inverse proportion to the percentage of land under cultivation."

Benton County.—My records include the following: Seven Sage Hens flushed from an island in the Columbia River near the old town site of Hanford, June 26, 1950 (H. A. Hansen); five flushed from another island in the same area, June 27, 1950 (Yocom); fourteen Sage Hens flushed in one group from the west side of the Columbia

River in a sage-brush flat three miles south of the old town site of Hanford; three flushed upstream in this same area, June 27, 1950 (Hansen and Yocom).

Considerable suitable range for this bird still occurs in this county.

Franklin County.—Carl V. Swanson, Game Biologist, states the following in his August, 1946, report to the state of Washington Department of Game:

"A. F. Swanson, Assistant to Resident Engineer—South Columbia Basin Project, reports seeing in July, 1946, a brood of Sage Hens in Franklin County. . . . The location was in T10N, R29E. In the late 1920's and the early 30's the Sage Hen was not uncommon in this area. . . . However, since 1934 or 1935 none had been seen or reported in that area. It is possible that they flew into the area from the west side of the river (Columbia River), a flight that has been personally observed. In 1934 (?) a pair of Sage Hens hatched out a brood of nine (9) young in Section 24, T9N, R29E, in Franklin County just north of the Charles Swanson farm, roughly two miles northwest from Pasco."

Adams County.—Sage Hens may still be found in the sagebrush areas in the western part of the county in the vicinity of Frenchmen Hills and the Saddle Mountains. Information for central and eastern part of the county includes a single recent record; During the summer of 1946, C. H. Henning, a rancher, who lived at that time on a ranch located on the west side of the channeled scablands through which Cow Creek runs after it leaves Sprague Lake, had a group of seven Sage Grouse on his place. Apparently this small group was a brood that was produced in that area and subsequently disappeared after that year (Robert Jeffrey and Yocom). Formerly, this county produced many Sage Hens, but the homesteaders and those who followed soon converted a large per cent of the vast sagebrush areas to wheat fields. John Harder, one of the Harder Ranchers who control nearly 100,000 acres of scabland and wheat land extending southwest of Sprague Lake along the Cow Creek Drainage, stated that Sage Hens were in this area in the early days but that he had seen only a single bird on two occasions in his lifetime on their property.

Whitman County.—Much of this rich land known as the Palouse Country was formerly covered with bunchgrass, which developed under a belt of increased rainfall owing to an increase in elevation, and only along the western edge were there any sage areas.

Pleistocene glaciation left barren areas of exposed basalt, known as the scablands, where deep coulees were cut along the western border of this county. Thin soils have developed in these areas since glacial activity terminated and the grasslands support grazing; sagebrush communities invaded some of these valleys and channels creating suitable limited range for grouse.

Sage Hens have been eliminated from this peripheral range for over twenty-five years according to accounts from reliable sources.

There were many Sage Hens on the Wiedrich Ranch in the early nineteen hundreds according to S. Wiedrich, who settled on the Palouse River a mile below the confluence of Rock Creek in 1902. The last grouse seen by the Wiedrich family consisted of five or six birds that wintered in a willow thicket on Rock Creek about one-half mile from its mouth. Fay Wiedrich was going to grade school at the time so he assumes that it was about 1926 (Fay Wiedrich).

William Hegler, former Whitman County Game Commissioner, told me in March, 1949, that Sage Hens were abundant in Cherry Creek Channel and Rock Lake Area in 1908 but not as numerous as the "prairie chicken" (Sharp-tailed Grouse). At that time Sage Hens provided considerable hunting.

Walla Walla County.—There are no recent records available for this county although accounts by early travelers through this area indicated that Sage Hens were

present in large numbers along the Snake, Columbia, and Walla Walla rivers (See above).

Columbia County.—Formerly Sage Hens were found in Columbia County (Jewett *et al.*, 1953); however, there are no recent records.

The purpose of this report is to get on record what is known about some of the history of the Sage Hen in the State of Washington so that it will be available for future workers in game management. The distributional information presented here is only fragmentary. It is hoped that others that have pertinent information on this species will record it. Management and population studies should be made on the remaining areas in Washington that are suitable for this species so that the Sage Hen will remain one of our harvestable game birds for many years to come on managed lands.

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GENERAL NOTES

Birds of Yang-Do, Korea.—From November, 1952, until September, 1953, I served with the U. S. Marine Corps in Korea. During this time short periods were spent in Pusan, Masan, Ascom City, and near Munsan-ni. However, owing to the exigencies of military duty, only the most casual sort of bird study was possible in these locations. On March 25, 1953, I reported for duty with the East Coast Island Defense Command and was assigned to the garrison of the Yang-Do island group. From that date until the evacuation of the islands on July 29, 1953, following the Korean armistice, I was able to devote considerable time and effort to collecting and observing the local bird life. The major purpose of this paper is to list the birds of Yang-Do as I was able to observe them and identify them.

Yang-Do consists of a group of four small islands lying far up the North Korean coast in latitude 40° 45′ North, almost within sight of the city of Songjin. Three of the islands, West Yang-Do, East Yang-Do, and Konghui-Do, are grouped closely together some 3,900 meters off the coast, and lie in a rough line extending eastward into the Japan Sea. The fourth island, Nan-Do, is separated from the other three. It lies some seven miles to the south-east and out to sea. Nan-Do, or Al-som (both names signifying Egg Island) is one of three islands of the same name on the Korean east coast. The Nan-Do so often mentioned by Austin in his *Birds of Korea* (Bull. Mus. Comp. Zool. 101: 1–301, 1948) apparently lies farther north near the mouth of the Tumen River. The third lies near the coast south of Wonsan Bay. All three apparently have many precipitous cliffs which sea birds utilize for nesting sites, and thus the name "Egg Island" is derived. It has long been the custom of the Yang-Do fishermen to visit Nan-Do in mid-May each year to collect eggs for food.

The westernmost of the group of three islands is Kilchu-Yang-Do or West Yang-Do. Roughly diamond-shaped, 1,000 meters long and 700 meters across, its highest point is 69 meters. This island was my home during most of my stay and was the scene of most of my collecting efforts. Here also was located the fishing village beside the narrow channel dividing West from East Yang-Do. This village was a permanent one despite the scarcity of fresh water. One of the villagers, a man of sixty-five years, had spent his entire life on the island. Most of the villagers, however, were refugees from North Korea. The hilltop is covered with the remains of small terraced fields where rice and barley were once grown. During my stay, however, the civilian populace received a dole of rice from the ROK government, and so concentrated their efforts on fishing. The Japanese had operated a small fish-oil plant there at one time, but only the foundations of the buildings remained.

Myongch'on, or East Yang-Do, is the smallest of the group, separated from West Yang-Do by a shallow channel no more than 100 meters wide. The long axis of the island, about 700 meters, runs north and south. It is in reality only half an island some 400 meters wide, the seaward side rising in a sheer cliff 46 meters to the full height of the island. The channel side is a gentle slope covered by old terraced fields. The north end of the island is connected to the remainder by a narrow neck into which the sea is slowly carving two spectacular sheer-walled clefts nearly a hundred feet deep and forty feet wide. This entire northern tip was blocked off by mines and barbed wire entanglements.

During this period both Yang-Do islands were encircled by mine-fields and wire, and several out-jutting capes were completely blocked off. These fortifications established refuge zones of considerable area in which the tall weeds had not been cut for two summers and in which no man dared prowl. Nesting cover for ground-nesting birds was probably better than it had been for many years. The mine-fields, however, were no deterrent to the semi-wild cats from the village which frequently

hunted among the mines but miraculously emerged unscathed.

Across a 500-meter channel southeast of East Yang-Do rises the steep-sided mass of Konghui-Do, the highest of the islands. At sea level Konghui-Do measures only about 900 by 300 meters, but it rises like a giant haystack to 114 meters in height. So steep are the rocky slopes that one small terraced field and several mounded Korean graves are the sole signs of occupancy. The Koreans fished and gathered seaweed along its rocky shores but rarely landed and were superstitious about the graves. The birds that nested and roosted on Konghui-Do were left relatively undisturbed.

The structure of these islands is plainly volcanic to even the most casual student of geology. The sea cliffs are a combination of dark rock resembling basalt and a porous red and gray rock strangely eroded and broken by the pounding of the sea. Approached in early spring they present a singularly dismal aspect, that of a row of abandoned ant-hills. Yang-Do has no forest cover, but only a few low shrubs, weeds, and grasses. There were a few exotic trees planted about the houses in the village, but no trees elsewhere on the island.

The main massif of Nan-Do is a jagged granite peak rising sheer from the water in a ridge some 600 meters long and 100 meters wide at the water line. The center of the north face rises in one great overhang 81 meters to the crest of the ridge. The south face is a slope of approximately 50 degrees and is convex, dropping off steeply near the bottom. The most spectacular features of the island are two keyholes of magnificent proportions which pierce the entire breadth of the island. The larger of the two is more than 100 feet high from boulder-strewn floor to massive chockstone.

Rising at either end of the main island are three separate smaller peaks, all so sheer that a landing is extremely difficult even in a calm sea. Landings are easily made on the main island in a small cove at the north end of the giant keyhole. Two expeditions were made to Nan-Do, on May 5 and May 19, 1953. Nesting had only just begun on the first occasion, but two weeks later was near its peak. The Koreans estimated that some 3000 eggs were collected on the latter visit. The sole vegetation on Nan-Do is a sparse cover of coarse grass growing among the slabs on the sunny south face.

Despite the lack of proper collecting equipment and storage facilities, 56 specimens representing 24 species were collected and preserved. All of these skins have been deposited with the Denver Museum of Natural History in partial recompense for many courtesies to me in the past. Sea-bird skins were identified by Dr. A. M. Bailey, land-bird skins by James C. Greenway. Specimens of two other species were obtained but were accidentally destroyed. Identifications not based on actual skins were either species that had been previously identified on the mainland or were identified largely on the basis of correspondence with Dr. O. L. Austin, Jr. These merit inclusion since the Yang-Do area has been little explored by ornithologists. Identification of many other species was unreliable and these have been omitted. Nomenclature and sequence are those of Austin's *Birds of Korea*.

Podiceps ruficollis poggei Reichenow. Chinese Little Grebe. One specimen was collected on the Naktong River near Pusan in December, 1952. Two grebes seen in the Yang-Do channel (March 28 and July 12) appeared to be the same species. Grebes were seen on numerous occasions but always too far out to be identified.

Puffinus leucomelas (Temminck). Streaked Shearwater. Two specimens were obtained at Nan-Do on May 5, when Koreans pulled them from holes under the rocks where they were apparently preparing to nest. The female was not yet ready to lay, however. None was ever seen around Yang-Do proper. One specimen was lost on evacuation of the islands.

Phalacrocorax carbo hanedae Kuroda. Japanese Cormorant. One specimen was collected on Yang-Do on May 5, 1953.

Phalacrocorax capillatus (Temminck and Schlegel). Temminck's Cormorant. One specimen was collected on Yang-Do on April 4, 1953.

Cormorants were numerous around Yang-Do throughout the observation period. Because of the difficulty of differentiating between the two species in the field, they are discussed together. On the May 5 trip to Nan-Do cormorants were found nesting on the overhanging north face along with and in numbers about equal to the murres. Most nests observed held two or three eggs. On the May 19 trip cormorants and their nests were found in about the same numbers as on the previous visit.

Ardea cinerea Linné. Gray Heron. This species was first observed at Yang-Do on March 27. A group of ten was found roosting on top of a crag at Nan-Do on May 5. They were frequently seen at Yang-Do during May and June, standing on the rocks off the beach.

Egretta alba (Linné). Great White Egret. One bird seen on July 7 flying up the middle of the Yang-Do channel.

Mergus serrator Linné. Red-breasted Merganser. Tentative identification of two birds seen on March 27 in Yang-Do channel. One bird was previously observed on the Han River below Seoul.

Butastur indicus (Gmelin). Gray-faced Buzzard-eagle. A flight of seven birds which passed over Yang-Do on May 20 and continued north into Hamgyong Pukto were tentatively identified as this species.

Aquila heliaca Savigny. Chinese Imperial Eagle. One bird was observed flying north over Yang-Do on March 29.

Circus cyaneus (Linné). Hen Harrier. One bird observed hunting low over West Yang-Do on April 25.

Falco peregrinus Tunstall. Siberian Peregrine Falcon. Frequently observed hunting singly on Yang-Do during May and June. A nest was discovered on Nan-Do on May 5, which contained three downy young. On the return visit on May 19 the young birds were beginning to feather out. Pictures were taken at that time.

Falco tinnunculus Linné. Kestrel. Observed on several occasions in April and May hunting singly on West Yang-Do.

Scolopax rusticola Linné. Woodcock. One bird flushed several times from the tall grass near the top of West Yang-Do on the evening of May 13.

Larus crassirostris Vieillot. Black-tailed Gull. The most common sea bird of the area, abundant about Yang-Do until early June and common throughout the period of observation.

On May 5 gulls were roosting in large numbers on Nan-Do but few eggs were found. It was estimated that gulls made up 90 percent of the population of Nan-Do at this date. On May 19 the gulls were nesting in earnest. The 3000 eggs collected by the Koreans were almost all gull eggs.

Uria aalge (Pontoppidan). Bering Island Murre. This species was seen infrequently on the sea south of Yang-Do in April. They were roosting in large numbers on Nan-Do on May 5. No eggs were seen, however. Three specimens were collected, but the skins were lost in the evacuation. Shotgun fire brought the entire flock up off the rocks in a cloud which fled north and continued out of sight. On May 19 murres were scarce on Nan-Do and no nests were observed. Infrequent observations were made on the sea near Yang-Do until mid-July. Most of the large flock seen on Nan-Do on May 5 is believed to have continued on up the coast.

Cepphus carbo Pallas. Sooty Guillemot. Common on the sea around Yang-Do throughout the period, singly or in flocks of up to 250 birds. They nested on Kong-

hui-Do. On May 19 they were abundant on the sea around Nan-Do. Five specimens were procured and are now in the Denver Museum.

Synthliboramphus antiquus (Gmelin). Ancient Murrelet. Common around Yang-Do until mid-May but there were no observations made after that time. The May 19 visit to Nan-Do found them in considerable numbers on the sea near the rocks. Four specimens were procured.

Cerorhinca monocerata (Pallas). Hornbilled Puffin. Occasionally seen on the sea south of Konghui-Do. Five specimens were collected on Konghui-Do in early April by Korean fishermen.

Columba livia Gmelin. Blue Hill Pigeon. One specimen was brought in by a Korean boy on April 17 but was accidentally destroyed. Only two other observations were made, two birds on April 2 and one more on April 22, both on Yang-Do.

Apus pacificus pacificus (Latham). Large White-rumped Swift. Swifts first appeared over the islands on May 2 when two birds were seen. The following evening a large flock was observed swirling about the crest of West Yang-Do. These birds were seen throughout the remainder of the period in flocks of 300 or more. No nests were observed although they spent much time about the seaward cliffs on East Yang-Do. Two specimens were collected.

Upupa epops saturata Lonnberg. Tibetan Hoopoe. One was collected on April 25 while feeding on beetles and caterpillars in the old terraced fields on West Yang-Do. No other observations were made of this unusual bird.

Alauda arvensis (Linné). Skylark. Frequently observed soaring above Yang-Do from April 1 to mid-July.

Hirundo rustica Linné. House Swallow. First observed on April 6. At least three pairs were resident on the islands through May and June. Two pairs nested under the eaves of an old house on East Yang-Do. On June 14 one nest contained three eggs and on July 8 four young were hatched. The second nest was destroyed.

Corvus levaillantii Lesson. Jungle Crow; Thick-billed Crow. A single crow was observed on April 8 and two more on May 3. All three appeared to be the thick-billed species, probably visitors from the forested hills just a few miles away on the mainland.

Pica pica (Linné). Korean Magpie. One bird was observed in an old field on the north side of West Yang-Do on April 5.

Parus major Linné. Great Tit. One bird was observed in a mine field on East Yang-Do on April 17 and another, possibly the same bird, in the same place two days later.

Turdus hortulorum Sclater. Gray-backed Thrush. One specimen was collected by a Korean on Nan-Do on May 5. None was observed on Yang-Do.

Turdus pallidus Gmelin. Pale Ouzel. One specimen collected on Yang-Do on April 22 was a male in breeding condition.

Turdus obscurus obscurus Gmelin. Gray-headed Thrush. One specimen collected on Yang-Do on May 20 was also a male in breeding condition. Nondescript thrushes were observed infrequently on Yang-Do from early April until the evacuation. Unfortunately it was not possible to identify these species in the field.

Monticola solitarius magnus (LaTouche). Large Red-bellied Rock-Thrush. First appeared on Yang-Do on April 22 and several remained through July 12. On May 29 several birds were carrying insects in their beaks as though feeding nestlings, and this behavior continued through June 25. Two specimens, a male and a female, were collected on June 6 and 7.

Tarsiger cyanurus cyanurus (Pallas). Siberian Blue-tail. Five specimens were collected by Korean children, four on April 9 and another on April 27. All were

collected near the minefields behind West Yang-Do village where they probably were nesting.

Larvivora sibilans Swinhoe. Swinhoe's Red-tailed Robin. A pair was collected on May 17 and 18. The male was in breeding condition.

Larvivora cyane (Pallas). Siberian Bluechat. One female collected on West Yang-Do on May 20 was not in breeding condition at the time.

Urosphena squameiceps ussuriana (Seebohm). Short-tailed Bush-Warbler. Two specimens were collected by Korean children on West Yang-Do on April 27. The sex was not determined with certainty, but probably both are males.

Regulus regulus japonensis Blakiston. Golden-crowned Kinglet. One specimen was collected by a Korean boy on West Yang-Do on May 7.

Siphia mugimaki (Temminck). Japanese Robin Flycatcher. Two specimens were collected on May 12 and 13 by Koreans. One was a male in breeding condition, but sex of the other was not determined.

Muscicapula narcissina Temminck. Narcissus Flycatcher. Two specimens were collected on May 17 and 18 near West Yang-Do village, both males in breeding condition.

Muscicapula cyanomelana cyanomelana (Temminck). Japanese Blue Flycatcher. Two males in breeding condition were collected by a Korean boy on West Yang-Do on May 13 and 14.

Motacilla alba lugens Linné. Pied Wagtail. A common summer resident, this species was first observed on March 27 shortly after my arrival at Yang-Do and was seen singly or in pairs almost every day until the evacuation. They were apparently nesting on the island although no nests were seen. Several birds were seen carrying insects in mid-June, apparently to nestlings. Four specimens were obtained.

Passer montanus dybowskii Domaniewski. Ussurian Tree Sparrow. Three specimens were collected by Koreans, one female on May 10 and two juvenile males on June 6. The species was common around the village on West Yang-Do.

Fringilla montifringilla Linné. Brambling. One specimen was collected on April 11 by a Korean boy on West Yang-Do. The bird was very fat and apparently in breeding condition.

I wish to express my appreciation to all who helped in the preparation of this paper: The Korean fishermen who brought me sea-bird specimens; a small boy, "Ky-iti," whose sling-shot was responsible for most of my small songbird skins; Dr. A. M. Bailey, Director of the Denver Museum of Natural History, Dr. O. L. Austin, Jr., and James C. Greenway, Harvard Museum of Comparative Zoology, all of whom gave great assistance in the identification of specimens and observations; Jack Putnam, taxidermist of the Denver Museum, who laboriously salvaged all possible value from my bedraggled specimens; and above all to my father, Johnson A. Neff, ornithologist of the U. S. Fish and Wildlife Service, who first pointed out the opportunity for significant bird study on Yang-Do and without whose constant encouragement and help the study could never have been accomplished.—DON J. NEFF, *3965 So. Bannock St., Englewood, Colorado.*

On *Cuculus canoroïdes* S. Müller.—*Cuculus canoroïdes* was described by Salomon Müller in a footnote on page 235 of his "Bijdragen tot de kennis van Timor en eenige andere naburige eilanden" in "Verhandelingen over de Natuurlijke Geschiedenis der Nederlandsche overzeesche bezittingen," edited by Temminck. This description, which appeared in 1845 (for the dates of publication of the different parts of the above mentioned work cf. Austral Avian Record, 1: 24, 1912) states

only that the species is in size, strongness of bill and feet, color and pattern quite as *Cuculus canorus*. The wing length is given as varying between 190 and 214 mm. The species was said to inhabit Java, Sumatra, Borneo, Timor and probably most of the islands between, and Malacca and Cochinchina.

Schlegel in his Catalogue (Muséum d'Histoire Naturelle des Pays-Bas, Monographie 25: Cuculi, pp. 7–11) enumerated 5 type specimens of *canoroïdes* sub nomine *Cuculus striatus*. Afterwards Finsch (Notes from the Leyden Museum, **23**: 101, 1901) stated that the type specimens of *canoroïdes* are undoubtedly specimens of *Cuculus canorus*. Consequently Hartert (Vögel palaärkt. Fauna, Bd. 2, 1912, p. 948) placed the name in the synonymy of *Cuculus canorus telephonus* with the remark that it had to be considered a nomen nudum because the description gave no characters to differentiate it from *canorus*. Müller's notes, bad as they are, certainly qualify as a description, and with the type specimens at hand it is not possible to consider Müller's name a nomen nudum.

A reëxamination of the material shows that Finsch's statement is wrong, and that all the type specimens of *canoroïdes* are representatives of *Cuculus saturatus*. The latter name is older having been first published in 1843. The specimens have the white (carpal) wing edge unbarred. There are fewer, broader, and more sharply defined bars on the underparts than normally found in skins of *Cuculus canorus* from East Asia. The specimens of *canoroïdes* which have a uniform blue upperside are slightly darker than specimens of *canorus*.

In the collections of the Leiden Museum there are no specimens of *Cuculus canorus* from the Indo-Australian Archipelago, nor are there any in the extensive Bartels Collection from Java. *Canorus* must be a very rare migrant in this region.

The name *Cuculus canoroïdes* is older than *Cuculus horsfieldi*, which now is the name of the large northern race of *Cuculus saturatus*, and therefore threatens the stability of the nomenclature of these cuckoos. The range of variation in the wing measurements of the type specimens of *Cuculus canoroïdes*, remeasured by me, is 185 to 215 mm.

As lectotype of *Cuculus canoroïdes*, I select an immature bird in the red phase, with a wing measurement of 187 mm., collected by Müller during August, 1836, on G. Doesoen, Poeloe Maja, off the west coast of Borneo (Schlegel catalogue s.n. *Cuculus striatus* no. 34). By this action the name *canoroïdes* sinks into the synonymy of *Cuculus saturatus saturatus*, which has a maximum wing measurement of about 194 mm. (cf. Junge, Temminckia 2: 199–200, 1937), the smallest specimens of *horsfieldi* measuring 192 mm.

For the loan of East Asian skins of *Cuculus canorus*, I am indebted to the authorities of the Museum of Comparative Zoology, Cambridge, U. S. A.—G. C. A. Junge, *Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.*

Height of a Flock of Migrating Ducks.—On October 15, 1952, at 4:00 P.M., while flying over Garvin County, Oklahoma, at an altitude of 5,700 feet, the pilot called my attention to a flock of about 30 ducks approaching the airplane in a line almost parallel with and approximately 100 feet lower than our line of flight, and less than 60 yards to our left. Although we were flying north at about 150 miles per hour and the ducks were flying south, we could see them clearly and identify them as one of the scaups, *Aythya*. The land elevation at this point is approximately 950 feet; the ducks were flying about 4,750 feet above the ground. A very light south wind was blowing.—Carl D. Riggs, *University of Oklahoma, Norman, Oklahoma.*

Spittle Insects as Food of Prairie Warblers.—A not uncommon feeding habit of the Northern Prairie Warbler near Bloomington, Indiana,—the rather systematic taking of immature spittle insects of the family Cercopidae—is interesting for several reasons.

In the first place, W. L. McAtee, reporting on the contents of the stomachs of some 80,000 Nearctic birds examined by the United States Biological Survey since 1885, states: "Our records do not show whether any immature Cercopidae . . . are eaten by birds." (McAtee, Smithsonian Misc. Coll. 85 [7]: 1–201, 1932.) Although not all suggestive titles listed in The Zoological Record since 1932 are available and some papers describing the food of particular species have therefore not been read, no subsequent references to young cercopids eaten by birds have been found.

Of broader interest is the relevance of the feeding habit under discussion to the question of the efficacy of the "spittle" as a protective mechanism. Most people are indirectly familiar with frog-hoppers or spittle bugs as a result of the masses of white froth, inhabited by nymphs and scattered conspicuously over the herbaceous plants on which the insects feed. The function of this exudation is evidently not a matter of agreement. Lutz quotes Kellogg as saying any advantage "is hard even to conjecture." (Lutz, Field Book of Insects, p. 78, 1935.) Imms believes the spittle "appears to protect the soft bodies of the nymphs from desiccation while it may also guard them to some extent against predators." (Imms, Insect Natural History, p. 206, 1947.) Comstock, on the other hand, says without hesitation: "It is evident that the covering of froth protects the spittle insects from parasites and other enemies." (Comstock, An Introduction to Entomology, p. 403, 9th ed., 1949.) As will appear, Comstock's proposition is emphatically not applicable to predation by Prairie Warblers, which rely on the froth to detect the insects' presence and on occasion search for it with considerable persistence.

According to Professor Frank N. Young, the commonest cercopid near Bloomington is the Meadow Spittle Bug, *Philaenus leucophthalmus* (Linn.), and it is probably this species which I have observed being eaten. From May to July spittle bugs abound on the soft plants of the open fields which in greater or lesser degree form part of all Prairie Warbler territories in the area. Where their concentrations are heaviest as many as 100 nymphs may occur within two or three square yards, and one plant may be dotted with several of the characteristic masses of spume.

While my study of the warbler has not yet included prolonged systematic observation of adult feeding habits and food, I would estimate that 15 per cent of the feeding time of the male, somewhat more in the case of the female, is spent foraging among herbaceous plants within three feet of the ground. In some seven or eight instances over a period of four summers I have watched adult warblers of both sexes flying from plant to plant, probing immediately into a mass of spittle, quite obviously eating the insect within, and then moving directly to another mass. The procedure has never extended to more than five or six plants in succession, but there can be no doubt from the behavior of the birds that they were searching for the spittle and, for the moment, specializing in cercopids as food.

This experience suggests either that Comstock is in error insofar as his category "other enemies" includes birds, or that if the production of the froth was originally an adaptation for concealment its value has been to some extent lost through the conditioning of the Prairie Warbler. Perhaps Dr. McAtee would go farther and find in the foregoing facts evidence to support the principle of "predation in proportion to population," which he advances in denial of the effectiveness of protective adaptations (McAtee, *op. cit.*, p. 136).—Val Nolan Jr., *R. R. 10, N. Fee Lane, Bloomington, Indiana.*

Titmice Killing Other Birds.—With reference to the note by Stewart (Auk, 72: 83, 1955) attention may be drawn to the fact that individuals of the European Great Tit (*Parus major*) may kill and eat other small birds when retained with them in the same cage. This is well known to aviculturists and reference to it is frequently found in books dealing with cage birds.

During the winter of 1954–1955, I obtained an immature Great Tit. The bird seemed ill and sat with its plumage fluffed out. After being fed as much as it would eat, it was put into a cage with a Redpoll (*Acanthis flammea*) and a Siskin (*Spinus spinus*). Food and water were available in the cage. The Great Tit was in such poor condition that I thought it impossible for it to harm its two healthy cage mates. However, the following morning the titmouse was found to have killed the Redpoll and eaten its brain. It was still clinging to its victim when discovered. A few hours later the Great Tit died, apparently as a result of its previously debilitated condition before capture. It is interesting that it was able to kill the Redpoll only a few hours before its own death in spite of its weakened condition.

There seems to be no record of the Great Tit killing other birds in the wild, and I have no knowledge of any other European species of *Parus* doing so even in captivity.

The circumstances of Stewart's record of cannibalism in a Tufted Titmouse (*Parus bicolor*) suggest the possibility of that bird having not only eaten, but also killed, its fellow. The Great Tit, having killed another bird, seems always first to open the skull and eat the brain. Since Stewart found a Tufted Titmouse eating the brain of its cage mate the possibility that it also killed it should not be ruled out unless there is certain evidence of a mammalian predator (as assumed by Stewart) having entered the cage.—GERD DIESSELHORST, *Zoologische Staatssammlung, Menzingerstr. 67, Munich 38, Germany.*

Cowbird Parasitism on Brown Thrasher.—In his "Notes on Cowbird Parasitism on Four Species" (Auk, 72: 88–92, 1955) Nickel quotes Bent as follows: " '—Tilford Moore (MS) saw a Brown Thrasher feeding three young Cowbirds.' No date, place, or other details were given."

It seems that this rather rare event should have its details recorded. I made this observation on July 1, 1943, at Midway Parkway and Pascal Street, in Saint Paul. Midway is one of those parkways with service roads on each side. These are separated from the main street by lawns 30 to 40 feet wide. It was on the south lawn that I saw the birds. The great contrast in color of the actors was what first drew my attention and caused me to stop. When I backed to get another view the Cowbirds flushed into a small tree, but the Thrasher continued its search for food in the grass.—TILFORD MOORE, *2265 Carter Avenue, Saint Paul 8, Minnesota.*

Lark Sparrow (*Chondestes grammacus*) on Bimini, Bahamas, B.W.I.—While a guest investigator at the Lerner Marine Laboratory of the American Museum of Natural History on Bimini during the summer of 1955 I recorded an adult Lark Sparrow, in good plumage, on the laboratory grounds on 23 August. When I pointed out the bird to Dr. Louis A. Krumholz, Resident Biologist of the Laboratory, he remarked that he had seen it in the same general area on the previous day. It was quite tame and could be approached to within about five yards. The bird remained in the vicinity of the laboratory buildings where it was observed daily until 26 August. The only other record of the Lark Sparrow from the West Indies appears to be a 12 December 1911 specimen taken by Ramsden (Auk, 29: 395,1912) from Guantánamo, Cuba.—RICHARD E. TASHIAN, *Department of Tropical Research, New York Zoological Society, New York 60, N. Y.*

Great Black-backed Gulls nesting on Little Haystack Island, Lake Huron. On July 1, 1954, during a trip to band Herring Gulls and Great Blue Herons at Little Haystack Island, along the west side of Bruce County, Ontario, in Lake Huron, I found two exceptionally large juvenile gulls. The feathers on these birds were well developed but not enough for them to fly. The plumage was much lighter than that of a similar-aged Herring Gull, and there was a distinct black band near the end of the tail, which terminated in a narrow white band. In these two features they resembled young Ring-billed Gulls rather than Herring Gulls. As number 6 bands were too small for their legs, I banded them with number 7 bands (numbers 517-30601 and 30602). As this area is so far from the recorded nesting range of any of the larger gulls, I first thought that they could be nothing more than abnormally large Herring Gulls.

During the next few days, I found it difficult to believe that I had properly identified these birds as Herring Gulls and felt that they might be Great Black-backed Gulls (*Larus marinus*), especially after checking with Plate 15 in Volume 62 of 'The Auk.' Bad weather prevented me from returning to the island before July 10 when, on my arrival, I was quite elated to see three adult Great Black-backed Gulls resting about 100 yards away on the lake.

A search in the area, where I had previously found and banded the birds, soon produced one of them; and, on looking for a young Herring Gull of approximately the same development for comparison, I found a third young Black-back which I banded with band number 517-30603. While we were handling and photographing these two young ones, one of the adult Great Black-backed Gulls kept flying overhead and scolding at us. By this time I was certain that our birds were Great Black-backed Gulls, and the rest of our party, who came along to see them, were all in agreement.

As there were quite a number of Herring Gulls' nests on this island (we banded 201 young Herring Gulls on July 1 and 9 more on July 10) we could not differentiate any nest as specifically belonging to the Great Black-backed. However these birds must have been from one of the nests as they were too young to have flown there.

I took a tail feather from one of these Great Black-backed Gulls as well as one from a young Herring Gull for comparison. These feathers were given to the Royal Ontario Museum of Zoology.

In checking with Mr. J. L. Baillie of that Museum, I found that there is no previous breeding record of this bird for Ontario, and I believe it is the first one for the Great Lakes. It will be interesting to see if this is the beginning of the extension of its nesting range to the whole Great Lakes area.

It might also be interesting to note that, about five months later on November 28, I noticed an immature Great Black-backed Gull with a flock of Herring Gulls at the Wiarton Fishery Dock, which is on the Georgian Bay side of Bruce Peninsula and is about fifteen miles in a direct line from little Haystack Island. This gull was banded on the right leg, as I had banded the ones in July and was possibly one of them.—HOWARD H. KRUG, *Chesley, Ontario.*

***Bubulcus ibis* in the Cauca Valley, Colombia.**—On May 11, 1954, while on a short visit to the Cauca Valley in western Colombia, I had the opportunity to observe from a relatively short distance—30 meters at the most—a flock of ten Cattle Egrets (*Bubulcus ibis*) in a pasture along the main highway about 3½ kilometers south of Guacarí, near the railroad crossing of Estación Ginebra, between Palmira and Buga, 980 meters above sea level. The locality, lying at 3° 43′ North

latitude, is the southernmost one presently known in the Colombian range of *Bubulcus ibis*. Other Colombian records and notes on the increasing numbers of the Cattle Egret in South America have been recently published by the writer (Lozania [Acta Zoologica Colombiana] No. 8, pp. 1–7, January 23, 1954 and Caldasia 7, 31, pp. 83–87, 1955).

The birds seen in the Cauca Valley were, as is usual with this species, in the company of cattle and busily feeding on the insects stirred up by their passage in the low grass. They were in non-breeding plumage (entirely white) and the bills of most of them were conspicuously reddish-orange at the base. PROF. ARMANDO DUGAND, *Research Associate, Instituto de Ciencias Naturales, Universidad Nacional, Bogotá, Colombia, South America.*

The Growth of a Chickadee's Tail Feathers.—On a number of occasions I have seen birds that have lost their tail feathers. Probably this is not an uncommon experience with other field observers. How such things happen is difficult to say.

In the winter of 1946–1947 a flock of Black-capped Chickadees (*Parus atricapillus*) fed at a shelf outside the kitchen window of my former home in Fairfield, Connecticut, where they could be observed from a distance of only two or three feet.

On December 14, 1946, I noted that one bird had lost its tail feathers. On December 23, I saw a new set of tail feathers growing out. They were far enough out so that the ends of the feathers reached the tips of the folded wings. On December 31, the new tail projected an inch beyond the wing tips. On January 4, 1947, I could no longer distinguish the bird from its companions, for the tail was practically full length.—ARETAS A. SAUNDERS, *Canaan, Connecticut.*

The Bean Goose and Other Birds from St. Lawrence Island, Alaska.—In the past several years, the Eskimos living on St. Lawrence Island have secured a representative collection of birds for the Denver Museum of Natural History. In addition to the common species to be expected, there are several taken near Savoonga which should be recorded. These are

Gavia viridigularis, Green-throated Loon, male, June 8, 1953
Colymbus grisegena, Red-necked Grebe, immature male, October 3, 1953
Puffinus tenuirostris, Slender-billed Shearwater, unsexed, June 12, 1951
Falco peregrinus anatum, Duck Hawk, immature male, September 15, 1950
Pagophila eburnea, Ivory Gull, unsexed, May 25, 1951
Aegolius funereus richardsoni, Richardson's Owl, male, March 1, 1953

In addition to the above, there is an adult male (No. 26811) *Anser fabalis serrirostris*, shot May 8, 1952, near Savoonga. It represents an addition to the A.O.U. list and was forwarded to the Museum by Dr. Everett L. Schiller. The body had been removed from the skin, but the head and wings were mummified. Fortunately, the museum preparators were able to save the specimen. The goose and the owl were identified by Drs. Herbert Friedmann and Alexander Wetmore.—ALFRED M. BAILEY, *Denver Museum of Natural History, Denver, Colorado.*

REVIEWS

The Honey-guides.—Herbert Friedmann, United States National Museum Bulletin 208, vii + 292 pp., 25 pls., 5 figs. in text, 1955.—This study of the habits and adaptations of honey-guides is highly commendable both for its especially interesting subject matter and its execution. The author's well considered plan of presentation of the monograph accurately explains its style: "If at times it may seem that unnecessary detail has been set forth I would remind the reader that our studies are still in the fact-finding stage, and that some of these possibly tedious minutiae may turn out to be revealing and significant in the light of further data . . . and may help to qualify or support some of the statements derived from them. . . . Throughout, every effort has been made to integrate all available knowledge, even when that integration is still on the merely suggestive level. In a field where the gaps in the evidence are so numerous, it seems better to venture occasionally with an interpretation or an opinion not yet wholly provable . . . than to follow the safer, but intellectually sterile, course of attempting to understand nothing because it is not yet possible to understand all."

The focal points of biological interest in the honey-guides are: (1) their brood parasitism and its level of adaptiveness; (2) the guiding habit; (3) wax-eating and digestion; and (4) the evolution and phylogeny of the group. These are treated in the first 82 pages of the book and are followed by a series of species accounts giving distribution, both of the species and their races, and the detailed documentation of natural history under appropriate topical headings. All the species are illustrated in color by Walter Weber. Other plates show habitats, the amazing bill and foot specializations of the nestlings, eggs of parasites and hosts, and Greater and Lesser honey-guides feeding on bee-comb.

The honey-guides (family Indicatoridae) consist of eleven species arranged in four genera. They are related to the barbets and occur in Africa and southern Asia. The evidence derived from distribution and phylogeny within the group is insufficient to permit conclusions regarding center of origin. There are more species and a greater diversity of types in Africa than in Asia, but the two Asiatic species are not closely related to one another and suggest long-standing presence in that area. *Indicator maculatus* of west Africa is probably as close as any member of the group to the presumed ancestral forest-dwelling stock of the family. In one phyletic line only, that leading to *Indicator indicator*, did the guiding habit develop. A second phyletic line, entailing principally a reduction in size and of the bill led to two subgenera of *Indicator*. A third line involving narrowing of the bill led to the monotypic genus *Melignomon* and the genus *Prodotiscus* with two species. The monotypic genus *Melichneutes* is an offshoot of the main generic stock represented by *I. maculatus*. There is considerable anatomical and behavioral evidence supporting the generic separations.

In their brood parasitism, the honey-guides (except *Prodotiscus*) victimize primarily picarian and coraciiform birds, which are hole nesters, and only such passerine forms as use similar nest sites. Thus the honey-guides are rarely in competition with the other parasitic birds (cuckoos and weaver finches) of Africa. The Indicatoridae have lost more of the ordinary features of the reproductive cycle than the other parasitic groups. They show less "attentive behavior." Territorial exclusiveness is lacking and courtship is absent or infrequent. Honey-guides do not have rapid nestling growth but parasitize in the main species of similar growth rate and with similarly unmarked eggs. However, in some and perhaps all, a nestling mandibular

hook is developed which early in nest life is used vigorously by the parasite to injure and eventually eliminate the host nestlings through death.

In their guiding behavior, the birds lead man and probably originally the honey-badger or ratel to the site of bees' nests by means of chattering conspicuously in front of them and flying ahead. "The bird evinces an excitement behavior when meeting with a potential symbiont, and this excitement abates only when the bird sees or hears flying, buzzing bees. Inasmuch as this latter is most apt to happen near a bees' nest, the result is that by following the excited bird the symbiont is usually eventually brought to the vicinity of a bees' nest. The whole behavior works out as if it were purposive, but there is no reason to read any 'purpose' or 'plan' into it." Although Friedmann is rightly inclined to rule out purpose and also prior knowledge of bee-nest locations before the guiding to them is instituted, he writes of the possible origin of the behavior as follows: "Originally the bird probably knew of one or more bees' nests, and when coming upon a ratel began to chatter as if in anticipation of the latter being already at the hive (with which the creature was associated in the bird's memory), and flew back to the known hive, followed by the [ratel]. . . . The flight back to the known bees' nest might have had to be a repetitive affair until the slower moving mammal reached the spot. From this it seems there developed the tendency to chatter to a symbiont even when no particular bees' nest may have been close at hand, and that the resulting series of flights that we call guiding eventually halted when the bird saw . . . bees. Thus, originally, 'guiding' would seem to have been more accurately a matter of leading to a known goal than it has since come to be. That it was never essential to either the bird or the mammal permitted its development . . . as a more or less adventitious addition to their food-seeking activities. . . . It is . . . difficult . . . to imagine the development of such a habit if it were the chief foraging method, as it would have been of no conceivable value to either until it was perfected by both."

Friedmann's best evidence for lack of purpose and knowledge of locations of bees' nests in the current manifestations of the behavior are his own tracings of guiding routes which even in open terrain were circuitous and random in direction. It is always difficult to prove a negative, and some may question lack of memory location in the honey-guides. But certainly if they have memory of the location of bees' nests, they seem not to put it to the most effective and direct use.

The role of the ratel as a follower in the guiding process seems now conclusively established by the assemblage of reports and testimony Friedmann has gathered. One only wishes that Friedmann might have seen this event himself but such an opportunity would rarely occur. Guiding of men still continues but with locally varying frequency. The author himself had 23 experiences in being guided.

Honey-guides are not dependent on mammalian symbionts for getting at honey comb. In one way or another they obtain it continually, and, most significantly, it is the beeswax they seek. When given a choice between dry, empty comb and comb filled with honey and larvae, they prefer the dry wax. Experiments were conducted which show that certain components of the beeswax, especially those of low softening and melting points, are assimilated by the bird. Moreover it was possible to keep honey-guides alive for as long as 32 days at a time on a diet of nothing but dried, cleaned beeswax. Signs of deficiency in diet showed up, but obviously the wax afforded a major element of nutrition for some time. Further studies on the digestive processes involved and on the role of bacteria are being pursued. Although wax-eating is not peculiar to honey-guides, no other types of birds show such avidity for it or consume it for its own sake.

This reviewer believes that no well-informed zoologist should miss studying Friedmann's important findings on honey-guides. They constitute a fascinating story with broad biologic implications. Furthermore, although the several topics are well developed to date, many more facets of behavior and function in this group are exposed for additional fruitful investigation.—ALDEN H. MILLER

New Zealand Birds.—W. R. B. Oliver. A. H. & A. W. Reed, Wellington. Second Edition. 661 pp. (Distributed by W. S. Heinman, 400 E. 72nd. St., New York 21. Price, $25.00.)—Oliver's standard work on the birds of New Zealand (see Auk, 48: 300–301, 1931) has been revised, enlarged, and brought up to date. The species accounts are excellent and include lists of important references, a feature which could be copied to good advantage by more authors of regional works. The section on extinct birds includes particularly valuable material on the moas, fossil penguins, and fossil rails and their allies.

The many illustrations are extremely variable as to quality and type. For example, to illustrate the sixteen forms of cormorants there are 21 photographs of birds in the wild, 1 of a mounted bird, 1 of the head of a skin, 4 sketches of heads, and 1 photograph of a plate from Buller's earlier work, together filling the equivalent of nine pages. These birds could, I am sure, have been better illustrated in two pages of wash or line drawings by a competent artist, with a saving of seven pages (and at least twenty-five cents in the not inconsiderable cost of the volume).

The value of the text, however, far outweighs shortcomings of the illustrations, and the work will probably remain the standard one for some years to come.—ROBERT W. STORER.

The Birds of the British Isles. Volume Five.—David Armitage Bannerman. (Oliver and Boyd, Edinburgh), xiii + 350 pp., 34 colored plates by George E. Lodge. Price, 63 shillings.—This volume is devoted to the diurnal birds of prey and is in format and quality similar to the preceding ones (see Auk, 71: 216–217, 1954). The species accounts, however, are expanded, averaging fourteen pages and including an even greater wealth of detail than those in the earlier volumes. A memorial to Lodge is included in the introductory material.—ROBERT W. STORER.

Bird Recognition III. Rails, Game-birds and Larger Perching and Singing Birds.—James Fisher. (Penguin Books Ltd.), 159 pp. 1955. Price, $0.85.—The third volume of this compact and useful work on British birds is similar to its predecessors in form (see Auk, 70: 222, 1953) and covers the doves, rails, gallinaceous birds, swifts, nightjars, kingfishers, cuckoos, corvids, starlings, larks, shrikes, thrushes, swallows, and several related smaller groups.—ROBERT W. STORER.

RECENT LITERATURE

EDITED BY FRANK McKINNEY

Anatomy and Embryology

Aldrich, E. C. 1956. Pterylography and molt of the Allen Hummingbird. Condor, **58**: 121–133.—Feather tracts of *Selasphorus sasin* are diagrammed in detail and discussed, and comparisons are made with certain other species. Specialized rectrices, which are sexually dimorphic, assist in production of flight sounds. Molt and degrees of plumage wear are suggested as criteria of age and sex.—D. W. J.

Bailey, R. E. 1955. The incubation patch of tinamous. Condor, **57**: 301–303.—Twenty-seven individuals of *Nothoprocta* from Peru have been examined in this study. All males had incubation patches during the breeding season (Feb.–Apr.), but males collected at other times of the year and all females lacked such patches. Gross anatomical descriptions are given for ventral apteria, molt, and the patches, and microscopic sections are depicted for nonbreeding and breeding males. These are the first details available for the incubation patches of ratite birds.—D. W. J.

Bas, C. 1954–1955. On the relation between the masticatory muscles and the surface of the skull in *Ardea cinerea* (L.) Parts I–III (to be continued). Kon. Nederlandse Akad. Wetensch. Ser. C. Biol. Med. Sci., **57**: 678–685, figs. 1–6. **58**: 101–120, figs. 7–40.

Berger, A. J. 1955. On the anatomy and relationships of Glossy Cuckoos of the genera *Chrysococcyx*, *Lampromorpha*, and *Chalcites*. Proc. U. S. Nat. Mus., **103**: no. 3335: 585–597, 3 pls.

Berger, A. J. 1956. The appendicular myology of the Pygmy Falcon (*Polihierax semitorquatus*). Amer. Midl. Nat., **55**: 326–333, 3 figs.

Burggraaf, P. D., and A. Fuchs. 1954–1955. On the correlation between the skull structure and the muscles in the male *Phasianus colchicus* L. Parts I–VII (to be continued). Kon. Nederlandse Akad. Wetensch., **57**: 286–303, figs. 1–10; 454–470, figs. 11–28; 666–677, figs. 29–35. **58**: 98–100; 114–120, figs. 36–40.

Fisher, H. I. 1955. Major arteries near the heart in the Whooping Crane. Condor, **57**: 286–289.—The major arteries of three "salvaged" *Grus americana* are described and compared with those of certain other gruiform species. Interspecific variations are believed to be, for the most part, really individual variations, because among these three specimens there were considerable variations. Similarities and differences are shown between *americana* and other gruiforms.—D. W. J.

Frank, G. H. 1954. The development of the chondrocranium in the Ostrich. Ann. Univ. Stellenbosch, **30** (3 & 4): 179–248, 30 figs.—The chondrocranium does not differ in any essential detail from that of carinate birds.

Hartman, F. A. 1955. Heart weight in birds. Condor, **57**: 221–238.—Percentage heart weights are given for 1340 birds of 291 species and 64 families. The birds were collected in the eastern United States and Panama. Hummingbirds have the largest hearts (2.4 per cent) and tinamous the smallest (0.2 per cent). Direct correlations are made between heart size and activity. There is no difference in heart size between the sexes. Some northern subspecies have larger hearts than do southern subspecies of the same species, and larger hearts can be associated with permanent residents at high altitudes. Birds have relatively larger hearts than mammals.—D. W. J.

Behavior

Armitage, K. B. 1955. Territorial behavior in fall migrant Rufous Hummingbirds. Condor, **57**: 239–240.

Banks, E. M. 1956. Social organization in Red Jungle Fowl hens (*Gallus gallus* subsp.). Ecology, **37**: 239–248.—A study of the social organization and peck-right dominance in four flocks totalling 26 hens. The social hierarchy was found to be quite stable.—R. W. S.

Borror, D. J., and C. R. Reese. 1956. Vocal gymnastics in Wood Thrush songs. Ohio Journ. Science, **56**: 177–182.—Audiospectographs reveal overlapping notes (in one record, 4 notes were uttered simultaneously), a rapid up and down fluctuation of pitch (as fast as 200 times per second), and other interesting physical characteristics.—H. C. S.

Bull, P. C. 1953. Observations on a marked population of Blackbirds at Lower Hutt. Notornis, **5**: 149–156.—Results generally follow those already reported from Blackbirds in Great Britain.—W. R. B. O.

Daanje, A. 1950. On locomotory movements in birds and the intention movements derived from them. Behaviour, **3**: 48–98.—An analysis of locomotion indicates that many displays may have evolved as ritualized intention movements. Many interesting examples are discussed and figured.—F. M.

Dilger, W. C. 1956. Nest-building movements performed by a juvenile Olive-backed Thrush. Wilson Bull., **68**: 157–158.—Typical nest-shaping actions of an adult female were performed by a juvenile *Hylocichla ustulata*.—J. T. T.

Dixon, K. L. 1956. Territoriality and survival in the Plain Titmouse. Condor, **58**: 169–182.—This significant six-year study involved a 144-acre canyon in which several occupied territories of *Parus inornatus* remained fairly constant. Defense of territories is discussed at length. On the basis of banded adults renesting year after year, the annual adult mortality is 24 per cent and further life expectancy of those adults is figured at 3.5 years. Since established adults dominate the population, juveniles must emigrate to establish their own territories.—D. W. J.

Goodwin, D. 1956. Further observations on the behaviour of the jay *Garrulus glandarius*. Ibis, **98**: 186–219.—This paper is based on observations of both wild and captive jays in England. Flight intentions, threat behavior, lateral and submissive display and food begging are discussed; nesting behavior is examined at length.—R. F. J.

Guhl, A. M. 1948. Heterosexual dominance and mating behavior in chickens. Behaviour, **2**: 106–120.—Experiments indicate that "the passive dominance of normal cocks over the hens in well integrated flocks facilitates mating."—F. M.

Klopfer, P. H. 1956. Goose-behavior by a White Leghorn [*Gallus gallus*] chick. Wilson Bull., **68**: 68–69.—When reared with a gosling.

Kramer, G., and U. von St. Paul. 1951. Über angeborenes und erworbenes Feinderkennen beim Gimpel (*Pyrrhula pyrrhula* L.) Behaviour, **3**: 243–255.—English summary. Experiments with models show that Bullfinches react with anxiety responses to objects which have (1) a hairy or feathered texture, (2) a convex shape, (3) a colored surface. Stuffed hawks and owls do not cause more anxiety than harmless species.—F. M.

Lyerly, S. B., B. F. Riess, and S. Ross. 1950. Color preference in the Mexican Violet-eared Hummingbird, *Colibri t. thalassinus* (Swainson). Behaviour, **2**: 237–248.

Marler, P. 1956. The voice of the chaffinch and its function as a language. Ibis, **98**: 231–261.—14 basic calls of *Fringilla coelebs* can give 21 different signals.

Information given in these calls concerns social, environmental, identifying, and locating phenomena. Responses to calls are of the two basic types characteristic of any system of communications: in one the responder behaves as the caller does, and in the other the responder behaves complementarily. It is concluded that the Chaffinch has a true language, although it is composed of a limited and rigid vocabulary.—R. F. J.

MEWALDT, L. R. 1956. Nesting behavior of the Clark Nutcracker. Condor, **58**: 3–23.—This paper is based primarily on the observation of a single pair of nutcrackers, but additional data were taken from five other pairs. At least nine calls and courtship activities are described. The territory of 2.1 acres was used for nesting only and was defended by the male against other nutcrackers. The female did most of the nest building, but the male, which had an incubation patch, incubated about 20 per cent of the time. The incubation period was 18 days. Attentiveness to the young and their development are described.—D. W. J.

NERO, R. W. 1956. A behavior study of the Red-winged Blackbird. I. Mating and nesting activities. Wilson Bull., **68**: 5–37, 4 figs.—A detailed description of the mating behavior of *Agelaius phoeniceus* in Wisconsin.—J. T. T.

NERO, R. W. 1956. A behavior study of the Red-winged Blackbird. II. Territoriality. Wilson Bull., **68**: 129–150, 3 figs.—The aggressive behavior of males in establishing and defending territories is described. Females defended small territories around their nests from other females.—J. T. T.

POULSEN, H. 1950. Morphological and ethological notes on a hybrid between a domestic duck and a domestic goose. Behaviour, **3**: 99–104.

POULSEN, H. 1951. Inheritance and learning in the song of the Chaffinch (*Fringilla coelebs* L.) Behaviour, **3**: 216–228.—Experiments with hormone injections and rearing in isolation showed that in adult males the improvement of song in the spring is due to the effect of male sex hormone; in young males the song has an innate basis but the perfect song is learnt by imitation.—F. M.

RÄBER, H. 1948. Analyse der Balzverhaltens eines domestizierten Truthahns (*Meleagris*). Behaviour, **1**: 237–266.—English summary. An analysis of the courtship of a domesticated turkey-cock. This individual had been raised away from others of its species and reacted to the appearance of a man by performing "courtship activities" while at the sight of a woman the bird would either attack or flee. The observations are interpreted in terms of a "hierarchy of moods."—F. M.

RÄBER, H. 1948. Das Verhalten gefangener Waldohreulen (*Asio otus otus*) und Waldkäuze (*Strix aluco aluco*) zur Beute. Behaviour, **2**: 1–95.—English summary. An experimental analysis of the perceptual world of owls seeking prey. The author confirms Lorenz's conclusion for predatory animals that killing and eating belong to two different functional centers. The owls would continue to kill although satiated. Experiments show that there are various visual releasing stimuli which initiate attack on a prey animal. Observations on the development of preying behavior in young birds do not indicate whether the recognition of these prey patterns is innate or acquired.—F. M.

RAND, A. L. 1956. Foot-stirring as a feeding habit of Wood Ibis and other birds. Amer. Midland Nat., **55**: 96–100.

RINEY, T. 1953. Notes on habitat and behaviour of the Rock Wren subspecies *Xenicus gilviventris rineyi* Falla. Notornis, **5**: 186–188.—Between Chalky and Dusky sounds, New Zealand.

SIMMONS, K. E. L. 1955. Studies on Great Crested Grebes. Avicultural Mag.,

61: 3–13, 93–102, 131–146, 181–201, 235–253, 294–316. (Reprinted by The Avicultural Society, 61 Chase Rd., Oakwood, London, N. 14, England. Price, 5 shillings.).—This is the most important paper yet published on the behavior of grebes and may serve as a model for future work on other species. The figures showing the displays of the Great Crested Grebe are particularly valuable.—R. W. S.

SKUTCH, A. 1956. Roosting and nesting of the Golden-olive Woodpecker. Wilson Bull., **68:** 118–128.—*Piculus rubiginosus*, the observations being made mostly in Central America.—J. T. T.

TINBERGEN, N. 1952. "Derived" activities; their causation, biological significance, origin, and emancipation during evolution. Quart. Rev. Biol., **27:** 1–32.—An important review which brings up to date the author's theories first put forth in 1940 (Zeitschr. f. Tierpsychol., **4:** 1–40). The situations in which displacement activities occur are analyzed. The most important are hostile and sexual situations. Intention movements and their ritualization are discussed and the conclusion deals with the function, causes, and evolution of display.—F. M.

TINBERGEN, N., and A. C. PERDECK. 1950. On the stimulus situation releasing the begging response in the newly hatched Herring Gull chick (*Larus argentatus argentatus* Pont.) Behaviour, **3:** 1–39.—Newly hatched chicks peck toward the red spot on the lower mandible of the parent, and thereby they reach the regurgitated food which is held in the tip of the parent's bill. The pecking response was analyzed in detail by the use of models of gull heads and bills which varied in color and shape. Many factors were important in releasing a high intensity reaction.—F. M.

VON HAARTMAN, L. 1951. Successive polygamy. Behaviour, **3:** 256–274.—Successive polygyny is described in detail in the Pied Flycatcher (*Muscicapa hypoleuca*) and comparison is made with the other known examples of polygamy in birds.—F. M.

WAGNER, H. O. 1954. Versuch einer Analyse der Kolibribalz. Zeitschr. Tierpsychol. **11:** 182–212.—A discussion of display, courtship flights, and "play flights" in hummingbirds.

WODZICKI, K., and F. H. ROBERTSON. 1955. Observations on diving of the Australasian Gannet (*Sula bassana serrator*). Notornis, **6:** 72–76.—Fishing habits of gannets and pattern of diving in New Zealand waters.

WOOLFENDEN, G. E. 1956. Preening and other behavior of a captive Horned Grebe [*Colymbus auritus*]. Wilson Bull., **68:** 154–156.

DISEASES AND PARASITES

ANDERSON, R. C. 1954. The development of *Ornithofilaris fallisensis* Anderson, 1954, in *Simulium venustum* Say. Journ. Parasit., **40:** (5, Sect. 2): 12.—Black flies are vectors of this common duck nematode.

CABLE, R. M., and L. A. QUICK. 1954. Some Acanthocephala from Puerto Rico with the descriptions of a new genus and three new species. Trans. Amer. Micro. Soc., **73:** 393–400.—One species from the Yellow-crowned Night Heron is redescribed.

CHATTERJI, P. N. 1954. Two new cestodes of the genera *Idiogenes* Krabbe, 1868, and *Choanotaenia* Railliet, 1896. Journ. Parasit., **40:** 535–539.—From Buzzard Eagle and Gray Teal in India.

CHU, G. W. T. C., and C. E. CUTRESS. 1954. *Austrolobilharzia variglandis* (Miller and Northrup, 1926) Penner, 1953, (Trematoda: Schistosomatidae) in Hawaii

with notes on its biology. Journ. Parasit., **40**: 515–524.—Cercariae cause swimmers' itch on Hawaiian sea beaches. Intermediate host a marine snail; natural definitive host Ruddy Turnstone.—J. D. W.

CLARK, D. T. 1954. A new cyclophyllidian cestode from the Avocet. Journ. Parasit., **40**: 340–346.—From Nebraska.

DIAMOND, L. S., and C. M. HERMAN. 1954. Incidence of trypanosomes in the Canada Goose as revealed by bone marrow culture. Journ. Parasit., **40**: 195–202.—Cultural and biopsy techniques described. Trypanosomes were present in from 14 to 40% of wild geese.—J. D. W.

ELSEA, J. R. 1954. An unsuccessful attempt to establish *Eustrongylides* in the Black-crowned Night Heron, *Nycticorax nycticorax hoactli*. Journ. Parasit., **40**: 362–363.—A nematode, larvae in minnows.

HERMAN, C. M., and E. E. WEHR. 1954. Fluctuations in intensity of *Amidostomum* infection in a wintering population of Canada Geese. Journ. Parasit., **40** (5, Sect. 2): 12–13.—Important gizzard nematode.

HOFFMAN, G. L. 1954. The occurrence of *Ornithodiplostomum ptychocheilus* (Faust) (Trematoda: Strigeida) in fish and birds. Journ. Parasit., **40**: 232–233.—Adults in ducks; metacercariae in various species of small fresh water fish in North Dakota and Wisconsin.

HOOGSTRAAL, H. 1954. *Ixodes* (*Ceratixodes*) *uriae*. White, 1952, parasitizing penguins and sea birds in the Falkland Islands (Ixodoidea, Ixodidae). Journ. Parasit., **40**: 232.—Found on two species of penguins, one gull, and two species of cormorants on one small island.

HOOGSTRAAL, H. 1954. A preliminary, annotated list of ticks (Ixodoidea) of the Anglo-Egyptian Sudan. Journ. Parasit., **40**: 304–310.—Sixty species, several from birds.

HUGGHINS, E. J. 1954. Life history of a strigeid trematode, *Hysteromorpha triloba* (Rudolphi, 1819) Lutz, 1931. II. Sporocyst through adult. Trans. Amer. Micro. Soc., **73**: 221–236.—Adults cosmopolitan in cormorants; first intermediate host an aquatic snail; second intermediate host Black Bullhead.—J. D. W.

JAISWAL, G. P., and S. N. SINGH. 1954. On two new trematodes of the genus *Philophthalmus* Loos, 1899, from the eyes of birds in Hyderabad, Deccan. Journ. Helminthol., **28**: 135–142.—From *Milvus govinda* and *Neophron percnopterus*.

LEIGH, W. H. 1954. Schistosome dermatitis in a South Florida lake. Journ. Parasit., **40** (5, Sect. 2): 43.—Several clinical cases caused by *Trichobilharzia physellae* cercariae; adult host Pintail.

MACGREGOR, W. G. 1955. Cyanide poisoning of songbirds by almonds. Condor, **57**: 370.

MANWELL, R. D. 1954. Blood parasites of birds of the high Rockies. Journ. Parasit., **40**: 229–231.—Extensive examinations found microfilariae and several genera of protozoans common.

MANWELL, R. D. 1954. A case of aspergillosis in a Song Sparrow. Journ. Parasit., **40**: 231.—From New York.

MIELCAREK, J. E. 1954. The occurrence of *Plasmodium relictum* in the Wood Duck (*Aix sponsa*). Journ. Parasit., **40**: 232.—In Pennsylvania.

OWEN, D. F. 1954. Protocalliphora in birds' nests. Brit. Birds, **47**: 236–243.

POULDING, R. H. 1954. Parasitism of a Herring Gull by the duck leech. Brit. Birds, **47**: 306–307.—*Theromyzon tessulatum* in Somerset.

RADFORD, C. D. 1954. The larval genera and species of 'Harvest Mites' (Acarina: Trombiculidae). Parasitology, **44**: 247–276.—Figures and host lists for identification in this important family; many are bird parasites.—J. D. W.

ROBINSON, E. J. 1954. Notes on the occurrence and biology of filarial nematodes in southwestern Georgia. Journ. Parasit., **40**: 138–147.—880 birds of 66 species examined; many infections with adults, larvae, and eggs of filariae found.

ROBINSON, E. J. 1954. Additional data on filarial worm infections in vertebrates of southwestern Georgia. Journ. Parasit., **40**: 690–691.—Host list for microfilariae and adults found in a large number of birds.

SCHILLER, E. L. 1954. Studies on the helminth fauna of Alaska. XVIII. Cestode parasites in young Anseriformes on the Yukon Delta nesting grounds. Trans. Amer. Micro. Soc., **73**: 194–201.—A new species of *Hymenolepis* described from the Spectacled Eider. Examination of many downy young of Emperor Geese, Cackling Geese, Spectacled Eider, and Pintail showed almost 100% infection with cestodes of several species. One gosling showed pathogenic effects.—J. D. W.

SINGH, K. S. 1954. Some trematodes collected in India. Trans. Amer. Micro. Soc., **73**: 202–210.—Two new species described and one redescribed from the Pintail.

SHELSWELL, E. M. 1954. A redescription of *Echinostephilla virgula* Lebour, 1909. Journ. Helminthol., **28**: 127–134.—Trematode from the Ruddy Turnstone in England.

SMITHERS, S. R. 1954. On a new anaplocephalid cestode, *Pulluterina nestoris* gen. et sp. nov., from the Kea (*Nestor notabilis*). Journ. Helminthol., **28**: 1–8.—From New Zealand bird in captivity in England.

WESTERSKOV, K. 1953. Bird pox in a New Zealand pipit. Notornis, **5**: 168–170.

WILLIAMS, G. R. 1955. A case of aspergillosis in the Black-backed Gull. Notornis, **6**: 166–167.—The causative organism was *Aspergillus fumigatus*.

WILLIAMSON, K. 1954. The Fair Isle apparatus for collecting bird ecto-parasites. Brit. Birds, **47**: 234–235.

YEH, L. S. 1954. On a new trematode *Allechinostomum renale* sp. nov. (Trematoda: Echinostomatidae) from *Pelecanus erythrorhynchos*. Journ. Helminthol., **28**: 159–164.—From North American bird in captivity in England.

YEH, L. S. 1954. On two new species of the genus *Serticeps* (Nematoda: Schistotophidae) from the gizzard of birds. Journ. Helminthol., **28**: 165–170.—From African *Nectarinia pulchella* and Brazilian *Cyanerpes cyaneus*, both in captivity in England.

DISTRIBUTION

(See also Taxonomy and Palaeontology)

ASH, J. S., and K. B. ROOKE. 1954. Balearic Shearwaters off the Dorset coast in 1953. Brit. Birds, **47**: 285–296.—On the field identification of *Puffinus puffinus mauretanicus* and its occurrence in British waters.

BRATTSTROM, B. H., and T. R. HOWELL. 1956. The birds of the Revilla Gigedo Islands, Mexico. Condor, **58**: 107–120.—In March and November, 1953, 34 species of birds were observed and/or collected on these volcanic islands, and, including the work of previous observers, a total of 53 species has been recorded. Many nest on the islands. A short discussion is devoted to the possible origin of some of these insular species.—D. W. J.

CHENG, TSO-HSIN. 1955. Chung Kuo Niao Lei Fen Pu Mu Lu. (A Distributional List of Chinese Birds. Part I, Non-Passeriformes.) (In Chinese, with a one page English summary.) Academia Sinica, Peking, 329 pp., 86 maps.—A check-list of "non-passerine birds heretofore recorded from China in her present boundaries, including Taiwan and nearby islands." The scientific name is followed by the reference and any pertinent synonymy in the English alphabet.

A common name, the range and dates of occurrence are in Chinese characters. The list includes 747 forms, plus 12 of questionable status, divided among 486 species. The maps illustrate the range of related species and subspecies.

DEMENTIEV, G. P., and N. A. GLADKOV. 1951–1954. The Birds of the Soviet Union. Moscow, State Publishers "Soviet Science." 6 vols. (In Russian.)—This important faunal study has been reviewed at length by D. D. Harber in British Birds, **48:** 218–224, 268–276, 313–319, 343–348, 404–410, 447–453, 505–511.

FRUGIS, S., and H. HOLGERSEN. 1955. Ornithological observations from Corsica, in June 1954. Sterna (Stavanger Museum), **22:** 1–26.—Annotated list.

GIZENKO, A. I. 1955. Ptitsy Sakhalinskoi Oblasti. Akademiya Nauk U.S.S.R. Sakhalinskii Filial, Moscow, 328 pp., 73 figs. (In Russian.)—Annotated list of 339 forms, recorded from the Sakhalin district, with occurrence, habits, characters, nesting and other details. A brief account of habitats is included, and a final chapter covers a summary relating to the Kurile Islands.

HANSON, H. C., P. QUENEAU, and P. SCOTT. 1956. The geography, birds, and Mammals of the Perry River region. Special Publ. No. 3, Arctic Inst. N. Amer. 96 pp.—Includes important contributions to our knowledge of the following geese: *Branta canadensis parvipes, B. bernicla orientalis, Anser albifrons* subsp., *A. c. caerulescens,* and *A. rossii.*—R. W. S.

HAVERSCHMIDT, F. 1955. North American shore birds in Surinam. Condor, **57:** 366–368.—Twenty species are discussed.

HERROELEN, P. 1954. L'ornithologie au Congo Belge. Première communication. Zooleo (Bull. Soc. Bot. Zool. congolaises), **29:** 519–523.—Annotated list of lower non-passerines.—R. W. S.

JOHNSTON, D. W. 1955. The Glaucous Gull in western North America south of its breeding range. Condor, **57:** 202–207.—Forty-one specimens of *Larus hyperboreus* are reported for western North America. There are 20 first-year birds, 18 second-year, no third-year, and two adults, plus one of undetermined age. Subadults are therefore much more common than adults. Detailed descriptions of the four age groups are given, and comparisons are made between first-year *hyperboreus* and *glaucescens.*—D. W. J.

KESSEL, B. 1955. Distributional records of waterfowl from the interior of Alaska. Condor, **57:** 372–373.

KURODA, N. 1955. Observations on pelagic birds of the northwest Pacific. Condor, **57:** 290–300.—This is a report of birds observed and collected on a 6000-mile voyage from Japan to the Bering Sea and return during June and July, 1954. Thirty-seven oceanic and 8 nonoceanic species were recorded, of which the most significant were *Puffinus bulleri, Pterodroma solandri,* and *Pterodroma inexpectata.* Correlations are made between air and water temperatures and numbers of birds seen; crude population densities are indicated.—D. W. J.

KRAUSE, H., and S. G. FROILAND. 1956. Distribution of the Cardinal in South Dakota. Wilson Bull., **68:** 111–117, 2 fig.—Since 1902, the year of the first nesting record, *Richmondena cardinalis* has spread over eastern South Dakota, mostly along the larger rivers.—J. T. T.

LONGHURST, W. M. 1955. Additional records of "Tule Geese" from Solano County, California. Condor, **57:** 307–308.

MAYR, E. 1953. Fragments of Papuan Ornithogeography. Proc. VII Pac. Sci. Congr., **4:** 11–19.—Geographical relationships of birds of New Guinea. Difference between distribution of plants and birds.—W. R. B. O.

MILLER, A. H. 1955. The breeding range of the Black Rosy Finch. Condor, **57:** 306–307.

MILLER, A. H. 1955. Acorn Woodpecker on Santa Catalina Island, California. Condor, **57**: 373.

MILLER, A. H., and W. C. RUSSELL. 1956. Distributional data on the birds of the White Mountains of California and Nevada. Condor, **58**: 75–77.

PAYNTER, R. A., JR. 1956. Avifauna of the Jorullo Region, Michoacán, Mexico. Postilla, **25**: 1–12.—Annotated list.—R. W. S.

PAYNTER, R. A., JR. 1956. Birds of the Swan Islands. Wilson Bull., **68**: 103–110.—An annotated list of 65 species, seven or eight being resident, recorded from two small islands in the western Caribbean Sea.—J. T. T.

PYLE, R. L. 1953. Annotated field list of the birds of southern California. Audubon Center of Southern California (San Gabriel River Wildlife Sanctuary), 664 N. Durfee Ave., El Monte, Calif. 40 pp.—Contains information on abundance and seasonal occurrence.—R. W. S.

RIPLEY, S. D. 1956. Considerations on the origin of the Indian avifauna. Natl. Inst. Sci. India Bull., **7**: 269–275.

RIPLEY, S. D., and G. E. WATSON, 3rd. 1956. Cuban Bird Notes. Postilla, **26**: 1–6.—Annotated list.—R. W. S.

SIBLEY, C. G. 1955. Nesting of the Western Tanager in the Santa Cruz Mountains, California. Condor, **57**: 307.

STEPHENS, T. C., W. G. YOUNGWORTH, and W. R. FELTON, JR. 1955. The birds of Union County, South Dakota. Nebr. Ornith. Union, Occas. Papers No. 1, 35 pp.—Annotated list.

STRAUTMAN, F. I. 1954. Ptitsy Sovetsky Karpat. Akademiya Nauk Ukrainskoi S. S. R., Kiev, 331 pp., 79 figs., 15 additional maps. (In Russian.)—Annotated list of 180 species of birds of mountainous Soviet Carpathia, southwestern Ukraine, with others recorded in the general region of the Ukraine that may be expected. Detailed discussion of habitats, including in this reptiles, amphibians and mammals in addition to birds.

TANNER, J. T. 1955. The altitudinal distribution of birds in a part of the Great Smoky Mountains. Migrant, **26**: 37–40.

TEAGUE, G. W. 1955. Aves del litoral Uruguayo. Observaciones sobre las aves indigenas y migratorias del orden *Charadriiformes* (Chorlos, Gaviotas, Gaviotines y sus congeneres) que frecuentan las costas y esteros del litoral del Uruguay. Com. Zool. Museo Hist. Nat. Montevideo, **4**, no. 72: 1–58.—Observations on the charadriiform birds of the coast of Uruguay.

TURBOTT, E. G. 1953. Distribution and speciation of land birds on offshore islands, northern New Zealand. Proc. VII Pac. Sci. Congr., **4**: 53–58.

VAN TYNE, J. 1956. What constitute scientific data for the study of bird distribution. Wilson Bull., **68**: 63–67.—After reviewing the history of the "sight record" in American ornithology, from its early, rare use to the present custom of publishing many, poorly evaluated records, the author calls for more care in the reporting, editing, and use of such records.—J. T. T.

WESTERKOV, K. 1956. History and distribution of the Hungarian Partridge in Ohio, 1909–1948. Ohio Journ. Science, **56**: 65–70.—An increase in the number of partridges occurred in western and northwestern Ohio up till 1937–40, when a rapid decline began, which is not considered to be a cyclic low.—H. C. S.

WILLIAMS, E. A. 1955. The Cattle Egret comes to South Carolina. Chat, **19**: 54–57.

ECOLOGY AND POPULATION

BRECKENRIDGE, W. J. 1956. Measurements of the habitat niche of the Least Flycatcher. Wilson Bull., **68**: 47–51, 1 fig.—Least Flycatchers (*Empidonax*

minimus) consistently used some parts of a woods more than others. An analysis of several aspects of the habitat revealed that the birds preferred the more open spaces beneath the forest canopy, where fewest limbs were present.—J. T. T.

DUNNET, G. M. 1956. The autumn and winter mortality of Starlings *Sturnus vulgaris*, in relation to their food supply. Ibis, **98:** 220–230.—Details of food taken, body and fat weight of Starlings, and composition of winter flocks indicate that mortality in winter cannot regulate the density of the breeding population. There is evidence that mortality in autumn could maintain population stability by acting as a "density-governed" factor; however, autumnal mortality was not measured.—R. F. J.

FLEMING, C. A., and WODZICKI, K. A. 1952. A census of the Gannet (*Sula serrator*) in New Zealand. Notornis, **5:** 39–78.—Annual cycle in New Zealand. Descriptions of New Zealand gannetries with counts of birds. The Gannet population is assessed at 21,033 pairs but may be as low as 18,000 or as high as 24,000. The paper is illustrated with 34 photographs and 4 maps.—W. R. B. O.

GOODPASTURE, K. A. 1955. Recovery of a Chickadee population from the 1951 ice storm. Migrant, **26:** 21–23.

KEAN, R. I. 1956. Notornis faeces as evidence on foods as a factor in chick rearing success. Notornis, **6:** 229–240.—Differences in availability and utilization of food types that are shown between two nesting areas investigated correspond to success and failure in chick rearing.—W. R. B. O.

KEAST, J. A., and A. J. MARSHALL. 1954. The influence of drought and rainfall on reproduction in Australian desert birds. Proc. Zool. Soc. London, **124:** 493–499.—These birds have "evolved an unusually high degree of nomadic mobility" and "exhibit a further vital physiological aspect of drought adaptation in that their sexual cycles can respond quickly to rainfall, or its effects, so that nidification may begin within a few days of heavy precipitation, irrespective of daylength and light increment."—R. W. S.

MARSHALL, J. T., JR. 1956. Summer birds of the Rincon Mountains, Saguaro National Monument, Arizona. Condor, **58:** 81–97.—In this significant ecological study, Marshall groups the major vegetation types into three woodland and two forest subtypes. The occurrence and something of the relative abundance of each avian species are presented for each of these vegetation types. Niche requirements are discussed for several species, and attention is drawn to the subspecies of Brown Creeper and House Wren found in the Rincons. Evidence from song and coloration indicates that *Troglodytes brunneicollis* (Brown-throated Wren) and *Troglodytes aedon* (House Wren) are conspecific.—D. W. J.

MCCANN, C. 1952. The Tui and its food plants. Notornis, **5:** 6–14.—Adaptations of flowers of New Zealand plants to visits of birds. Drawings show how the stigma and anthers touch the birds' foreheads while they are sipping nectar from the bases of the flowers.—W. R. B. O.

PALUDAN, K., and J. FOG. 1956. Den Danske Ynglebestand af vildtlevende Knopsvaner i 1954. Danske Vildtundersøgelser No. **5**, 47 pp. (In Danish, with English summary.)—The Danish breeding population of wild-living *Cygnus olor* in 1954.

RAND, A. L. 1956. Changes in English Sparrow population densities. Wilson Bull., **68:** 69–70.—Populations of *Passer domesticus* have varied with the use of grain in feeding domestic animals, decreasing with fewer horses, etc.—J. T. T.

General Biology

Barnard, G. C. 1956. Nesting of the Blue-black Grassquit [*Volatinia jacarina*] in Panama. Condor, **58**: 229–231.

Bendell, J. F. 1955. Age, molt, and weight characteristics of Blue Grouse. Condor, **57**: 354–361.—This study is concerned primarily with molts and weights of yearlings and adults so that these two age groups might be separated. Characters employed for separation include length of the outer pair of rectrices, presence or absence of the bursa of Fabricius, and average weight. Whereas, yearlings usually have bursas longer than adults', some breeding adults had a bursa and others lacked them. Yearling females may breed, but none of the yearling males was breeding. The average weight of adults was significantly greater than weights of yearlings.—D. W. J.

Berger, A. J. 1955. Six-storied Yellow Warbler nest with eleven Cowbird eggs. Jack-Pine Warbler, **33**: 84.

Berger, A. J. 1956. Barn Swallows and Rough-winged Swallows nesting under bridges. Jack-Pine Warbler, **34**: 10.

Berger, A. J. 1956. Prairie Horned Lark nesting notes. Jack-Pine Warbler, **34**: 69–72.

Betts, M. M. 1954. Experiments with an artificial nestling. Brit. Birds, **47**: 229–231.—An artificial nestling was used to sample the food brought to the nest by a pair of Pied Flycatchers.

Black, M. S. 1955. Some notes on the Black-billed Gull (*Larus bulleri*) at Lake Rotorua, with special reference to the breeding cycle. Notornis, **6**: 167–170.

Cain, A. J., and I. C. J. Galbraith. 1956. Field notes on birds of the eastern Solomon Islands. Ibis, **98**: 100–134; 262–295.—An annotated list of 138 species. Coverage varies from 2 or 3 short paragraphs to six full pages on *Aplonis brunneocapillus* and usually is concerned with recognition, habitat, voice, gut contents, and miscellaneous observations.—R. F. J.

Cottrille, B. D. 1956. Chimney Swifts apparently nesting in Pileated Woodpecker hole in live tree. Jack-Pine Warbler, **34**: 30–31.

Cruickshank, A. D. 1956. Nesting heights of some woodland warblers in Maine. Wilson Bull., **68**: 157.—267 nests of seven species.

Davis, D. E. 1955. Observations on the breeding biology of Kingbirds. Condor, **57**: 208–212.—A decline in clutch size in *Tyrannus tyrannus* may occur during the breeding season since a mean number of eggs in 30 nests was 3.5 whereas the mean number of young in 32 nests was 2.7. Heights of nests and habitats are discussed.—D. W. J.

Friedmann, H., and J. Kern. 1956. The problem of cerophagy or wax-eating in Honey-guides. Quart. Rev. Biol., **31**: 19–30.—Honey-guides were reared in captivity for 18 to 27 days on a diet of beeswax. The intestinal microflora is responsible for the degradation of beeswax. Thus the selective value of cerophagy is related to the importance of wax to the dietary picture.—J. H.

Genelly, R. E. 1955. Annual cycle in a population of California Quail. Condor, **57**: 263–285.—This is a major contribution toward the life history of this species because Dr. Genelly has spent three years observing annual behavior patterns and physiological changes of a marked feral population. Detailed discussions include pair bonds and formations, functions of calls, fighting and threatening, gonad size, molt, and weight. Most of the anatomical data for reproduction were taken from nearby populations especially for the male, but the data for females were obtained by live-trapping. Males did not develop

incubation patches. By knowing either the weight or the stage of molt of the primaries, it is possible to determine the age of juvenal quail up to about 150 days.—D. W. J.

GULLION, G. W. 1956. Evidence of double-brooding in Gambel Quail. Condor, **58:** 232–234.

HERROELEN, P. 1953. La Chevêchette à queue barrée, *Glaucidium Sjöstedti* Reichenow au Congo belge. Bull. Cercle Zool. Cong., **21:** 9–11.—Description, habits, and distribution.—R. W. S.

HERROELEN, P. 1954. Notes sur le comportement de la Guignette de rivage, *Actitis hypoleucos* (Linné), au Congo Belge. Ann. Mus. Congo Tervuren, **1:** 31–33.—Notes on molt, weight, distribution, habitat, food, migration, and behavior.—R. W. S.

INTERNAL AFFAIRS DEPT. 1953. Notes on Notornis, 1951–52. Notornis, **5:** 144–148.—Behavior, relationships with other animals.

JOHNSTON, R. F. 1956. Predation by Short-eared Owls on a *Salicornia* salt marsh. Wilson Bull., **68:** 91–102, 2 figs.—The foraging habits and food of *Asio flammeus* in the San Francisco Bay region are described. 90 per cent of the mass of food eaten is *Microtus* and *Rattus*.—J. T. T.

JOHNSTON, R. F. 1956. The incubation period of the Clapper Rail. Condor, **58:** 166.—Two observations each revealed an incubation period of 23 days.

KELLY, J. W. 1955. History of the nesting of an Anna Hummingbird. Condor, **57:** 347–353.—This detailed study of *Calypte anna* was an almost daily one from January 4 to March 6. The author has added materially to the extant knowledge on nest construction, incubation period, hatching, and care of young. Climatological data are correlated with these phases of the nesting cycle.—D. W. J.

KELLY, J. W. 1956. Prolonged incubation by an Anna Hummingbird. Condor, **58:** 163.

KENNEDY, J. G. 1955. Takahe research 1954–1955 season: a summary. Notornis, **6:** 164–166.—Breeding season, chick survival, measurements, deer and Takahe.

LEGG, K. 1956. A sea-cave nest of the Black Swift. Condor, **58:** 183–187.

LOWE, C. H., JR. 1955. Gambel Quail and water supply on Tiburon Island, Sonora, Mexico. Condor, **57:** 244.

MIDDLETON, D. S., and B. J. JOHNSTON. 1956. A study of the Phoebe in Macomb County. Part 1. Jack-Pine Warbler, **34:** 63–66.

MOREL, G., and F. BOURLIÈRE. 1955. Recherches écologiques sur *Quelea quelea quelea* L. de la basse vallée du Sénégal. I. Données quantatives sur le cycle annuel. Bull. Inst. Francais d'Afr. Noire, **17** (ser. A): 617–663.—Data on the number of nests per tree and the number of trees per colony, clutch size, number of clutches, the role of the parents in incubation, nesting success, sex ratio at various ages, banding returns, wing length, morphology and development of the gonads, and food.—R. W. S.

NICE. M. M. 1956. Four generations of a Song Sparrow family. Jack-Pine Warbler, **34:** 57–62.

SIBLEY, C. G. 1955. The responses of salt-marsh birds to extremely high tides. Condor, **57:** 241–242.

SKUTCH, A. F. 1956. Life history of the Ruddy Ground Dove. Condor, **58:** 188–205.—In Skutch's most recent contribution to Central American ornithology, he presents the usual life history data for *Columbigallina talpacoti*, including mating, nest construction, eggs, incubation, and nestling activities.—D. W. J.

STEINBACHER, J. 1955. Über die Schwanzmauser der Eulen (Strigidae) und

Nachtschwalben (Caprimulgidae). Senckenbergiana Biologica. **36:** 235–240.—On the tail molt of owls and nightjars.

SUMMERS-SMITH, D. 1954. Colonial behaviour in the House Sparrow. Brit. Birds, **47:** 249–265.—An important study of *Passer domesticus*. In a rural area in Hampshire, sparrows are separated into isolated breeding colonies of about 10–15 pairs. The structure of a breeding colony is described and there is a discussion of colonial nesting.—F. M.

SUTTON, G. M., and D. F. PARMELEE. 1955. The Purple Sandpiper in Southern Baffin Island. Condor, **57:** 216–220.—Field observations and descriptions of adult specimens are presented.

SUTTON, G. M., and D. F. PARMELEE. 1956. The Rock Ptarmigan in southern Baffin Island. Wilson Bull., **68:** 52–62, 3 fig.—Notes on the activities of *Lagopus mutus* during summer, including nesting, nesting success, and molt.—J. T. T.

WAGNER, H. O. 1953. Der Breitschnabelschnäpper (*Rhyncocyclus* [sic] *brevirostris* Cabanis) mausert die Handschwingen während der Brutzeit. Veröffentl. Überseemuseum Bremen, Ser. A, Vol. **2**, Pt. 3: 211–212.—Molting of the remiges in *Rhynchocyclus brevirostris* (Tyrannidae) during the breeding season. The nest of the species is described and figured.—R. W. S.

WALKINSHAW, L. H. 1955. Nesting of the Olive-sided Flycatcher in Schoolcraft County, Michigan. Jack-Pine Warbler, **33:** 134–136.

WARHAM, J. 1956. The breeding of the Great-winged Petrel *Pterodroma macroptera*. Ibis, **98:** 171–185.—At Eclipse Island, off western Australia, this petrel begins breeding in March, has eggs by the end of May, and the young are fledged in November. The incubation period lasts perhaps 53 days; two fledging periods were known to be 128 and 134 days. There is no starvation period.—R. F. J.

WILLIAMS, G. G. 1956. Altitudinal records for Chimney Swifts. Wilson Bull., **68:** 71–72.—*Chaetura pelagica* seen from an airplane at about 7000 feet three different times under similar weather conditions.—J. T. T.

WILLIAMS, G. R. 1952. *Notornis* in March, 1951. Notornis, **4:** 202–208.—Observations in Takahe Valley and Point Burn, Fiordland, New Zealand, dealing with molt, behavior of chick, adult behavior, occupation of territory, census, deer and Takahe. The known population is 23, possibly 27.

MIGRATION AND ORIENTATION

COOPER, J., AND A. LYSAGHT. 1956. Migrating pintails [*Anas acuta*] in the central Pacific. Ibis, **98:** 316–319.

GIBBS, A., I. C. T. NISBET, and P. S. REDMAN. 1954. Birds of North Donegal in autumn, 1953. Brit. Birds, **47:** 217–228.—Observations on migration in northwest Ireland.

HOLGERSEN, H. 1954. Ornithological observations from Utsira, 1952. Sterna (Stavanger Museum) **12,** 32 pp.—Observations on fall migration on the island of Utsira, Norway.—R. W. S.

HOWELL, J. C. 1955. A comparison of ceilometer mortality at Knoxville and Nashville, Tennessee, in 1951 and 1954. Migrant, **26:** 53–57.

JOHNSTON, D. W. 1955. Mass bird mortality in Georgia, October, 1954. Oriole, **20:** 17–26.—At one locality 50,000 birds were killed.

OWEN, D. F., D. W. SNOW, and R. E. MOREAU. 1955. Observaciones ornitologicas otonales en el norte de Espana. Ardeola, **2:** 57–78. (In Spanish, with English summary.)—Ornithological observations in northern Spain in the autumn of 1954, including data on visible migration.—R. W. S.

REDMAN, P. S., and W. D. HOOKE. 1954. Firecrests in Britain, 1952–1953. Brit. Birds, **47**: 324–335.—A large autumn immigration of *Regulus ignicapillus* into the British Isles, followed by wintering and a further immigration in the spring is described and correlated with meteorological conditions. Wintering was thought to be due to adverse weather conditions inhibiting the migratory urge.—F. M.

RIGGS, C. D. 1955. Night migration of the Scissor-tailed Flycatcher. Condor, **57**: 310.

SERVENTY, D. L. 1956. A Japanese recovery of an Australian-ringed *Puffinus tenuirostris*. Ibis, **98**: 316.

SORENSEN, J. H. 1954. Royal Albatross A99. Notornis, **6**: 25–27.—Ringed as fledgling on Campbell Island, south of New Zealand, Oct. 4, 1943, when about 7 months old; captured at El Tabo, Province of Santiago, Chile, at end of March or beginning of April, 1944. The bird was in an exhausted condition and died soon after.—W. R. B. O.

STEIN, P. A. S. 1955. Dispersal of New Zealand Gannets. Notornis, **6**: 58–64.—Records of ringing at Cape Kidnappers and Horuhoru Islet and of recoveries in New Zealand and Australia. Twenty-seven birds ringed have been recovered on the coasts of New South Wales, Victoria, and South Australia. Birds from Cape Kidnappers have been recovered from northerly stations as far south as 34° S., while those from Horuhoru were collected from 30° S. southwards.—W. R. B. O.

WALKINSHAW, L. H. 1956. Migration of the Chimney Swift in Calhoun County, Michigan. Jack-Pine Warbler, **34**: 29.

WEISE, C. M. 1956. Nightly unrest in caged migratory sparrows under outdoor conditions. Ecology, **37**: 274–287.—Nocturnal activity is correlated with physiological state and appears to be a reliable indicator of the migratory condition.—R. W. S.

WILLIAMSON, K. 1954. Paddyfield Warbler at Fair Isle. Brit. Birds, **47**: 297–301.—The second British record of *Acrocephalus agricola* is correlated with the weather conditions over Europe which favored drift from the East.

WILLIAMSON, K. 1954. Gray-cheeked Thrush at Fair Isle: a new British bird. Brit. Birds, **47**: 266–267.

WILLIAMSON, K., and A. BUTTERFIELD. 1954. The spring migration of the Willow Warbler in 1952. Brit. Birds, **47**: 177–197.—Detailed analysis of the migration of *Phylloscopus trochilus* through Britain in the light of the migrational drift theory.—F. M.

PHYSIOLOGY

BASTIAN, J. W., and M. X. ZARROW. 1955. A new hypothesis for the asynchronous ovulatory cycle of the Domestic Hen (*Gallus domesticus*). Poultry Sci., **34**: 776–788.—A stimulating discussion of value to ornithologists interested in the process of egg production and factors affecting the number of eggs laid.— P. H. B.

BAUM, G. J., and R. K. MEYER. 1956. Influence of diethylstilbestrol on lipids in intact and hypophysectomized cockerels. Endocrin., **58**: 338–346.

BRENEMAN, W. R. 1956. Steroid hormones and the development of the reproductive system in the pullet. Endocrin., **58**: 262–271.

FISHER, H. I. 1956. Apparatus to measure forces involved in the landing and taking off of birds. Amer. Midland Nat., **55**: 334–342.

GLICK, B., T. S. CHANG, and R. G. JAAP. 1956. The Bursa of Fabricius and Antibody Production. Poultry Sci., **35**: 224–225.—The bursa of the domestic fowl produced antibodies to *Salmonella typhimurium*.—P. H. B.

IRVING, L. 1955. Nocturnal decline in temperature of birds in cold weather. Condor, **57**: 362–365.—The body temperatures of seven species of birds held in captivity in Alaska were taken at various times of the day and night in winter. Even though winter air temperatures varied between − 9° C and − 22° C, the body temperatures by day were about the same as on warmer days. Nocturnal body temperatures were 0.9–4° C lower. Also discussed are matters relating to diurnal activity among arctic owls and the elevation of body temperature during activity. The conclusion is drawn that at least some homoiotherms can change their body temperatures in sleep, waking rest, and activity, both in cold and temperate weather conditions.—D. W. J.

MOULTRIE, F., C. D. MUELLER, and L. F. PAYNE. 1955. Molting and Growth of Individual Feathers in Turkeys Exposed to 10 or 24 Hours of Daily Light. Poultry Sci., **34**: 383–388.—A difference in extent of molting in postjuvenal primary and secondary wing feathers characterized turkeys reared under 10- and 24-hour regimes of daily light. Under 10 hours the birds molted no postjuvenal wing feathers, while under continuous light they molted postjuvenal primary 1 and secondaries 2, 3, and 4.—P. H. B.

OAKESON, B. B. 1956. Liver and spleen weight cycles in nonmigratory White-crowned Sparrows. Condor, **58**: 45–50.—Liver and spleen weights were taken for nonmigratory (*nuttalli*) and migratory (*gambelii*) races of *Zonotrichia leucophrys*. Cyclic changes in these organs' weights were similar, both showing declines at the height of testis development, and yet one race migrated whereas the other did not. It is concluded that the decline in weights could not be directly attributed to stress associated with a long migratory flight, but that inherent endocrine changes are responsible for low body, liver, and spleen weights at the end of migration.—D. W. J.

ODUM, E. P., and C. E. CONNELL. 1956. Lipid levels in migrating birds. Science, **123** (3203): 892–894.

ODUM, E. P., and J. C. MAJOR. 1956. The effect of diet on photoperiod-induced lipid deposition in the White-throated Sparrow. Condor, **58**: 222–228.—One group of white-throats was given a high fat diet and another group fed on a low fat diet. Both groups were then exposed to gradually increased photoperiods in midwinter. Birds given the high fat diet had only a little more subcutaneous fat at the end of the experiment, and resembled more closely normal premigratory birds than did the experimentals given the low fat diet.—D. W. J.

SHIRLEY, H. V., JR., and A. V. NALBANDOV. 1956. Effects of neurohypophysectomy in domestic chickens. Endocrin., **58**: 477–483.

WILSON, W. O., and A. WOODARD. 1955. Some Factors Affecting Body Temperature of Turkeys. Poultry Sci., **34**: 369–371.—In air temperatures between 65° to 105° F, the amount of shade influenced the body temperature. Air temperatures above 90° caused hyperthermy.—P. H. B.

TAXONOMY AND PALAEONTOLOGY

BEHLE, W. H. 1956. A systematic review of the Mountain Chickadee. Condor, **58**: 51–70.—For each of the seven subspecies of *Parus gambeli*, the author discusses racial characters of color and the standard measurements, geographic distribution, variation, and intergradation with other subspecies. Suggestions are made as to the oldest subspecies and origins.—D. W. J.

BRODKORB, P. 1956. Pleistocene birds from Crystal Springs, Florida. Wilson Bull., **68**: 158.—*Anas carolinensis, Aythya collaris, Aramus guarauna.*

BUTTERFIELD, A. 1954. *Falco columbarius subaesalon* Brehm: a valid race. Brit. Birds, **47**: 342–347.

CADE, T. J. 1955. Variation of the Common Rough-legged Hawk in North America. Condor, **57**: 313–346.—One of the most variable hawks is *Buteo lagopus*, and it is this individual variability of plumage characters of North American and nearby Asiatic specimens which is investigated in detail by the author. Molt, extreme colorations, sexual dimorphism, weight, mensural characters, and population genetics are some of the subjects which are discussed. Nomenclaturally, the North American breeding population is *sancti-johannis* east of the Mackenzie River whereas west of the river to the Bering Sea, specimens are considered to be intergrades with the Siberian subspecies, *kamtschatkensis* Dementiev. This latter name should replace *pallidus* (Menzbier) which, in the absence of unequivocal specimens, should be deleted from the North American list.—D. W. J.

CUNNINGHAM, J. M. 1953. Notes on the immature plumages of *Larus bulleri* and *L. novaehollandiae*. Notornis, **5**: 166–167.

FALLA, R. A. 1953. Description of a new form of New Zealand Wren. Notornis, **5**: 142–143.—*Xenicus gilviventris rineyi*, Lake McArthur, south of Dusky Sound, New Zealand.

FALLA, R. A. 1954. A new rail from cave deposits in North Island of New Zealand. Rec. Auck. Mus., **4**: 241–244.—*Capellirallus karamu*, n. gen. and n. sp. Skeleton found in cave at Karamu.

GURR, L. 1952. A skeleton of *Notornis hochstetteri* Meyer from Waitati, Otago. Trans. Roy. Soc. N. Z., **80**: 19–21.—Description with list of occurrences in South Island.

HACHISUKA, M. 1953. The affinities of *Pityriasis* of Borneo. Proc. VII Pac. Sci. Congr. **4**: 67–69.—Most likely an aberrant member of the shrikes.

HARDY, J. W., and R. W. DICKERMAN. 1955. The taxonomic status of the Maroon-fronted Parrot [*Rhynchopsitta terrisi*]. Condor, **57**: 305–306.

HOLGERSEN, H. 1955. On the type-locality of *Phylloscopus collybita abietinus* (Nilsson). Sterna (Stavanger Museum) **18**: 1–4.—Restricted to Stjørdalen (= Stjørdal), Nord-Trøndelag, Norway.—R. W. S.

HOWARD, H. 1955. Fossil birds from Manix Lake, California. Geol. Surv. Prof. Paper 264-J: 199–205, pl. 50.—Twelve species, three of which are extinct, recorded from upper Pleistocene deposits. *Phoenicopterus minutus*, new species.

JOLLIE, M. 1955. A hybrid between the Spruce Grouse and the Blue Grouse. Condor, **57**: 213–215.—*Canachites canadensis franklini* × *Dendragapus obscurus richardsonii* taken on November 12, 1950, in Benewah County, Idaho.

JUNGE, G. C. A. 1956. New bird records from Biak Island. Zool. Mededel. (Leiden), **34**: 231–237.—Notes on ten species. *Aviceda subcristata obscura*, new subspecies.

KOEPCKE, M. 1954. *Zaratornis stresemanni* nov. gen. et nov. sp. Un cotingido nuevo de Peru. Pub. Mus. His. Nat. "Javier Prado," Ser. A. Zool., no. 16, 8 pp. 2 fig.—A new genus and species of cotinga, most nearly related to *Doliornis* and *Heliochera*.—M. A. T.

MARPLES, B. J. 1952. Early Tertiary Penguins of New Zealand. N. Z. Geol. Surv. Pal. Bull., **20**: 1–66.—Monographic study of the bones of 8 species (5 being new). New genera: *Platydyptes, Archaeospheniscus, Duntroonornis, Korora*.

MAYR, E., and J. C. GREENWAY, JR. 1956. Sequence of passerine families (Aves). Breviora (Mus. Comp. Zool.), **58**, 11 pp.—Includes a report by the editors of Peters' check-list on the sequence to be followed in that work.

MERTENS, R., and J. STEINBACHER. 1955. Die im Senckenberg-Museum vorhandenen Arten ausgestorbener, aussterbender oder seltener Vögel. Senckenbergiana Biologica, **36**: 241–265.—List of the rare, vanishing, and extinct birds in the Senckenberg Museum.

MILLER, A. H., and R. I. BOWMAN. 1956. A fossil magpie from the Pleistocene of Texas. Condor, **58**: 164–165.

MILLER, A. H., and R. I. BOWMAN. 1956. Fossil birds of the late Pliocene of Cita Canyon, Texas. Wilson Bull., **68**: 38–46, 1 fig.—Material is described from four species, two being considered new species: *Plegadis gracilis*, new species, and *Meleagris leopoldi*, new species.—J. T. T.

NEILL, W. T., H. J. GUT, and P. BRODKORB. 1956. Animal remains from four preceramic sites in Florida. Amer. Antiquity, **21**: 383–395.—Remains of 24 species of birds recorded.—R. W. S.

ORR, P. C. 1956. Pleistocene Man in Fishbone Cave, Pershing County, Nevada. Nevada State Mus. Bull. 2, pp. 1–20, 11 figs.—Records of Western Grebe, American Merganser, Shoveler, and American Coot, and part of the skin of a young pelican, from archeological deposits with radiocarbon dates of 6000 to 10,000 years ago.

PARTRIDGE, W. H. 1954. Estudio preliminar sobre una coleccion de aves de Misiones. Rev. Inst. Nac. Invest. Cien. Nat., **3**: 87–153, pls. 1–4. (In Spanish, with English summary.)—A preliminary study of a collection of birds from the Province of Misiones, Argentina.

PHILLIPS, A. R., and K. C. PARKES. 1955. Taxonomic comments on the Western Wood Pewee. Condor, **57**: 244–246.

PINTO, O. 1954. Resultados ornitológicos de duas viagens cientificas ao Estado de Alagoas. Papéis Avulsos Dept. Zool. Secretaria Agric. São Paulo, **12**: 1–97. (In Portuguese, with English summary of new subspecies.)—Annotated list of the birds of the State of Alagoas, Brazil. *Xenops minutus alagoanus, Sclerurus caudacutus caligineus, Thamnophilus aethiops distans, Conopophaga melanops nigrifrons, Schiffornis turdinus intermedius, Platyrinchus mystaceus niveigularis, Cyanocorax chrysops interpositus*, new subspecies.—R. W. S.

PINTO, O. M. DE O., and E. A. DE CAMARGO. 1955. Lista anotada de aves colecionadas nos limites ocidentais do Estado do Paraná. Papéis Avulsos Dept. Zool. Secretaria Agric. São Paulo, **12**: 215–234. (In Portuguese.)—Annotated list of a collection of birds from the State of Paraná, Brazil. *Hylocharis chrysura lessoni, Campylorhamphus trochilirostris guttistriatus*, new subspecies.—R. W. S.

PITELKA, F. A., R. K. SELANDER, and M. ALVAREZ DEL TORO. 1956. A hybrid jay from Chiapas, Mexico. Condor, **58**: 98–106.—*Calocitta formosa* × *Psilorhinus mexicanus*.

PIVETEAU, J. 1955. Oiseaux, *in* Traité de Paléontologie, vol. V, Amphibiens, Reptiles, Oiseaux, La sortie des eaux, Naissance de la Tétrapodie, l'Exubérance de la Vie Végetative, la Conquête de l'Air. pp. 994–1091, Publ. Masson et Cie., 120, Boulevard Saint-Germain, Paris VI^e. Price of complete volume 12,800 francs. (In French.)—A general resumé based mainly on Lambrecht's Palaeornithologie (1933), including in addition some recent studies, as that of de Beer on *Archaeopteryx*, Gregory on the skull of *Ichthyornis*, Marples on Seymour Island Penguins, and Tucker on the origin of birds. Following a brief summary of the skeleton and other morphological characters in birds, there is a systematic review of the orders and families known as fossils in which pertinent examples are cited in running paragraph style under generic names. The classification in the main is that of Berlioz. Of value as a general summary but without specific detail.

RAND, A. L., and R. L. FLEMING. 1956. Two new birds from Nepal. Fieldiana, Zool., **39**: 1–3.—*Dendrocopus* [sic.] *auriceps conoveri* from west Nepal, and *Garrulax affinis bethelae* from east Nepal and Sikkim, new subspecies.

SCARLETT, R. J. 1953. A sub-fossil Hawk from New Zealand. Rec. Cant. Mus., **6**: 245–252.—*Circus eylesi*, n. sp., Pyramid Valley; also Lake Grassmere.

SIMPSON, L. O. 1955. A note on a green Moa egg from Chatto Creek, Central Otago. Trans. Roy. Soc. N. Z., **83**: 223–226.—Discussion on position of egg and its identification.

SIMS, R. W. 1956. Birds collected by Mr. F. Shaw-Mayer in the central highlands of New Guinea, 1950–1951. Bull. Brit. Mus. (Nat. Hist.), **3**: 389–438, pls. 13–14.—Annotated list of 88 species and subspecies.

SOERGEL, E. 1955. Über einige vogelreste (Seeadler, Kraniche) aus dem Neolithikum von Ehrenstein bei Ulen. Jahreshefte Ver. vaterländ. Naturk. Württemberg, 110 Jahrg., pp. 121–124, 1 fig.—Remains of *Haliaeetus albicilla*, *Grus grus*, and *Grus antigone* in southwestern Germany. The last mentioned, the Sarus Crane, is known in modern times from India eastward (casual records from south Russia being in error).

STORER, R. W. 1955. A preliminary survey of the sparrows of the genus Aimophila. Condor, **57**: 193–201.—On the basis of measurements, color, habitat, nests, song, and skeletal proportions, the genus *Aimophila* is considered to be composed of at least two natural groups of species. One group inhabits arid tropical scrub: *mystacalis*, *humeralis*, *ruficauda*, *sumichrasti* and *strigiceps*. Another group inhabits temperate grassland or savanna: *aestivalis*, *botterii*, *petenica*, and *cassinii*. Five additional species cannot be relegated to either of these two groups: *quinquestriata*, *carpalis*, *ruficeps*, *notosticta*, and *rufescens*. Until more data are available for these latter species, *Aimophila* should not be split.—D. W. J.

VERHEYEN, R. 1955. Contribution à la systématique des Piciformes basée sur l'anatomie comparée. Bull. Inst. Roy. Sci. Nat. Belg., **31**, no. 50, 24 pp., and no. 51, 19 pp.—A classification of the Piciformes based on the comparative anatomy of the group. The Galbulidae and Bucconidae are placed in one suborder, and the other four families in a second.—R. W. S.

VOOUS, K. H. 1955. On *Phylloscopus collybita* from Norway. Sterna (Stavanger Museum), **18**: 4–7.—Taxonomic notes.—R. W. S.

WETMORE, A. 1955. A supposed record of a fossil cormorant. Condor, **57**: 371.

WETMORE, A. 1956. A fossil Guan from the Oligocene of South Dakota. Condor, **58**: 234–235.

WETMORE, A. 1956. A check-list of the fossil and prehistoric birds of North America and the West Indies. Smiths. Misc. Coll., **131** (5), 105 pp.—The present work lists 189 forms still living and 248 extinct species, a total of 88 more species than were listed in Wetmore's 1940 check-list. 17 forms are listed for the Cretaceous, 9 from the Palaeocene, 33 from the Eocene, 18 from the Oligocene, 52 from the Miocene, 59 from the Pliocene, and 247 from the Pleistocene.—R. W. S.

WESTERSKOV, K. 1953. Taxonomic status of the Redpoll in New Zealand. Notornis, **5**: 189–191.—Belongs to the British subspecies *Carduelis flammea cabaret*.

WILLIAMS, J. G. 1955. A systematic revision and natural history of the Shining Sunbird of Africa. Condor, **57**: 249–262.—Measurements, colors of plumage and distributions are given for the five subspecies of *Cinnyris habessinicus: habessinicus*, *turkanae*, *alter*, *hellmayri*, and *kinneari*. Three distinct plumages (juvenal, immature, and adult) and molts are described in some detail. Under the subject of Natural History, there follows for each subspecies a discussion of

habitat, food, field appearance, voice, display, breeding seasons, nesting sites and nests, and descriptions of eggs.—D. W. J.

Miscellaneous

Lockwood, W. B. 1954. Linguistic notes on "Fulmar." Brit. Birds, **47**: 336–339.

Nelson, T. 1956. The history of ornithology at the University of Michigan Biological Station, 1909–1955. Minneapolis, Burgess Publ. Co. xvi + 106 pp.—Contains an annotated list of the birds found near the Station (in Cheboygan Co., Mich.) and a list of student reports on file there.—R. W. S.

O'Bryan, A. 1956. The Diné: Origin Myths of the Navaho Indians. Smiths. Inst. Bur. Amer. Ethn., Bull. **163**, 1–187. Government Printing Office, Washington 25, D. C. $1.75.—The Navaho story of creation—the five worlds, people, animals of all kinds, and their change and development as told by a chief of his people for preservation in print for future generations. Birds figure prominently in the myths, e.g.,—the Kingfisher who dived to retrieve a lost medicine bag, The Woodpecker who drilled the hole through which the people entered the fourth world, the Grebes that guarded the water entry to the fifth and present world, the Rock Wren who brought the cliff rocks in which he lives, and various others.

Sibley, C. G. 1955. Ornithology *in* A Century of Progress in the Natural Sciences, 1853–1953. San Francisco, Calif. Acad. Sci. pp. 629–659.

Contributors during 1956: P. H. Baldwin, L. M. Bartlett, A. J. Berger, E. R. Blake, J. T. Emlen, H. Friedmann, J. J. Hickey, H. Howard, J. C. Howell, J. Hudson, D. W. Johnston, R. F. Johnston, S. C. Kendeigh, F. McKinney, W. R. B. Oliver, H. C. Seibert, R. W. Storer, J. T. Tanner, M. A. Traylor, J. D. Webster, A. Wetmore, D. A. Zimmerman.

Dues notices for 1957 have recently been mailed. To reduce the costs and work of the Treasurer's office members are requested to return their payments before January 1, 1957. Late payments require special mailings of 'The Auk' with associated additional postage and handling costs.

The "business reply envelope" being used this year requires no postage. Persons dropping their membership are asked to notify the Treasurer so that up-to-date records may be maintained.

OBITUARIES

HANS THOMAS LANGE SCHAANNING, Corresponding Fellow of the A.O.U. since 1923, died in Kragerö, Norway, March 5, 1956, three days after his 78th birthday.

Schaanning was born in Oslo March 2, 1878. When only 22 years old he went to the Pasvik Valley in east Finnmark, close to the Russian border. He always longed to return to the sub-arctic wilderness of this remote and little-known country. His stay of 12 years was interrupted by excursions to parts of northern Russia and to Novaya Zemlya, where he wintered in 1902–1903.

In 1918, Schaanning was appointed curator and head of the natural history department of the museum in Stavanger, a position which he held until he retired in 1948 at the age of 70.

Schaanning was the first to introduce into Norway (1914) the method of banding birds for the study of migration. At the Stavanger Museum he developed the marking method that gradually became the major one of the two schemes in existence in Norway. His interest in migration also resulted in the erection of a bird-banding station on the shore of the North Sea some 20 miles from Stavanger. This station has had unrivaled success in the trapping and marking of arctic waders (see Bird-Banding, 24: 147–153, 1953).

Schaanning published a number of short notes and papers, mainly on Norwegian faunistic features. His most important works deal with arctic material from various Norwegian expeditions to Jan Mayen, East Greeland, Arctic North America (Northwest Passage, "Gjöa"-Expedition 1903–07; "Fram"-Expedition 1898–1902), Siberia, and the Siberian part of the Arctic Ocean.

His last paper, issued in Oslo (1954) is "A Contribution to the Ornithology of Eastern Siberia" (Nytt Mag. f. Zoologi Vol. 2). It is based upon collections made by his friend Johan Koren and includes a color plate of the only known egg-clutch in the world of *Calidris tenuirostris*, found at the Kolym Estuary, 1917 (preliminary note in 'The Ibis,' 1929).

Schaanning was keenly interested in the problems of bird protection and had been a member of the International Committee for Bird Protection since 1922.—HOLGER HOLGERSEN.

ROBERT PONCY, a Corresponding Member of the American Ornithologists' Union since 1932, died at Geneva, Switzerland, December 7, 1955, at the age of 81. He spent a good part of 60 years observing the birds of Lake Geneva. In the course of this period, he managed to increase considerably the knowledge of their food habits, movements, and behavior. His influence on the study of birds in French Switzerland has been considerable. He published a great many notes in French and Swiss magazines.—J. DELACOUR.

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Compiled by L. R. Wolfe

THE AUK

A Quarterly Journal of Ornithology

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For publication in 'The Auk,' articles or notes must present material that is of significance to ornithologists and that has not been published elsewhere. All manuscripts should be typewritten, double spaced, with wide margins. Titles should be brief. Terminal bibliographies are used as a rule for long articles. Only works actually cited in the text are to be included in these bibliographies; works not so cited will be deleted by the editors. Where fewer than five references to literature are made, they may be inserted in parentheses in the text. References in manuscript for 'General Notes' should be in the text. Consult issues of 'The Auk' since January, 1949, for style of citation. Long articles should be summarized briefly. Footnotes, Roman numerals, and ruled tables are to be avoided. Acknowledgments belong in the text. Line drawings must be in India ink on white paper or drawing board; usually these should be planned for at least one-half reduction when printed. Thus, details and lettering must be correspondingly large. Legends must be brief. Photographs must be hard, glossy prints of good contrast. Common and scientific names of North American birds should follow the A.O.U. Check-List and supplements except in taxonomic papers giving critical discussions.

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Gyldenstolpe, Count Nils (Carl Gustaffersen), Naturhistoriska Riksmuseum, Stockholm 50, Sweden	(1918)	1934
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Palmgren, Prof. Pontus, Zoologiska Museet, N. Jarnvagsgatan 13, Helsingfors, Finland	(1932)	1946
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Salomonsen, Dr. Finn, Zoologisk Museum, Krystalgade Copenhagen K, Denmark	(1949)	1953
Schüz, Dr. Ernst, Stattl. Museum für Naturkunde (14a), Stuttgart 0, Germany	(1938)	1953

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Ali, Salim A., 33 Pali Hill, Bandra, Bombay 20, India ..... (1944) 1948
Armstrong, E(dward) A(llworthy), St. Mark's Vicarage, Barton Rd., Cambridge, England 1951
Baxter, Miss Evelyn Vida, The Grove, Upper Largo, Fife, Scotland 1919
Beaufort, Prof. Lieven Ferdinand de, De Hooge Kley, Amersfoort, Netherlands 1926
Belcher, Sir Charles Frederic, South Kinangop, Kenya, British East Africa 1934
Benson, C(onstantine) W(alter), Litton House, Trull Road, Taunton, Somerset, England 1954
Bertoni, Dr. Arnoldo de Winkelreid, Puerto Bertoni, Paraguay 1919
Bourlière, Prof. Francois, Faculté de Medecine de Paris, 45 Rue des Saints Peres, Paris 6e, France 1954
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De Lavalle, Jose Antonio, Lima, Peru 1925
Dementiev, Prof. Georges, Zoological Museum, Moscow Government University, Moscow 9, U.S.S.R. 1934
Drost, Dr. Rudolf, Danziger Strasse 26, Wilhelmshaven, Germany 1934
Dugand, Armando, Universidad Nacional, Instituto de Ciencias Naturales, Apartado Postal No. 2535, Bogotá, Colombia 1952
Engelbach, Dr. Pierre, 10 rue Copernic, Paris XVI, France 1949
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Grant, Claude Henry Baxter, 8 Cornwall Gardens Court, 50 Cornwall Gardens, London, S.W. 7, England 1920
Groebbels, Dr. Franz, Physiologischer Institut Krankenhaus, Hamburg, Eggendorf, Germany 1933
Haartman, Baron Lars Von, Zoological Institute, University of Helsingfors, Norra Jarnvagsgatan, 13, Finland 1954
Haverschmidt, François, P.O. Box 644, Paramaribo, Surinam, Dutch Guiana ..... (1928) 1950
Hindwood, Dr. K. A., Wingello Place, Angel Place, Sydney, New South Wales 1938
Ingram, Collingwood, The Grange, Benenden, Cranbrook, Kent, England .. 1920

Iredale, Tom, % Australian Museum, Sydney, New South Wales 1918
Johansen, Dr. Hans, Zoological Museum, University of Copenhagen, Copenhagen, Denmark .....
Johnson, Alfred William, Casilla 327, Santiago, Chile ..... (1950) 1952
Junge, Dr. G.C.A., Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands 1939
Kramer, Dr. Gustav, Max Planck Institut für Meeresbiologie, (23) Wilhelmshaven, Germany 1951
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MacDonald, James David, British Museum (Natural History), Cromwell Road, London, S.W. 7, England 1949
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Mayaud, Noël, 80 rue du Ranelagh, Paris XVI, France 1949
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Nicholson, E(dward) M., 13 Upper Cheyne Row, London, S.W. 3, England 1954
Oliver, Dr. Walter Reginald Brook, 26 Ventnor St., Seatoun, Wellington, E. 5, New Zealand 1923
Philippi B., Rodulfo Amando, Tobalaba 157, Santiago, Chile ..... (1941) 1952
Poncy, Prof. Robert, Weber 15, Geneva, Switzerland 1932
Rensch, Dr. Bernhard, Zoologisches Institut der Westfalischen Landes-Universität, Bade-Str. 9, (21a) Munster (Westf.), Germany 1932
Richdale, Lancelot E(ric), Department of Zoological Field Studies, Edward Grey Institute of Field Ornithology, Botanic Garden, Oxford, England ..... (1943) 1947
Sassi, Dr. Moriz, Naturhist. Museum, Burgring 7, Vienna 1, Austria 1934
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Schouteden, Dr. H., Musée du Congo Belge, Tervuren, Belgium 1934
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Seth-Smith, David W(illiam), 69 Palace Court, London, W. 2, England 1920
Skead, Mr. C. J., Kaffrarian Museum, King Williams Town, Cape Province, Union of South Africa .....
Skovgaard, Peter, Viborg, Denmark 1926
Stegmann, Dr. Boris Charles, Zoological Museum, Academy of Science, Leningrad, U.S.S.R. 1932
Stoneham, Lt. Col. Hugh Frederic, Stoneham Museum and Research Centre, Kitale, Kenya Colony, British East Africa ..... (1928) 1930
Takatsukasa, Prince Nobusuke, 87 Yoyogisanya, Shibuya-Ku, Tokyo, Japan 1924
Ticehurst, Norman Frederic, Spots House, Small Hythe, Tenterden, Kent, England 1918
Tinbergen, Dr. Niko, Department of Zoology, University Museum, Oxford, England 1938

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Van Someren, Dr. Victor Gurnet Logan, Box 658, Nairobi, Kenya Colony, British East Africa 1921
Verheyen, René K., Kolonielaan 87, Antwerpen, Belgium 1954
Vincent, Col. Jack, P.O. Box 44, Mooi River, Natal, South Africa 1949
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Adams, Laura (Louise) C., Andrews, South Carolina 1950
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Addy, C(harles) E(dward), Star Route 1, Box 402, Laurel, Maryland 1938
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F Allen, Robert Porter, Tavernier, Florida ..... (1933) 1955
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EM Allin, Dr. Albert E(llis), Provincial Health Laboratory, Fort William, Ontario, Canada ..... (1939) 1955
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EM Alvarez del Toro, Miguel, Apartado Postal No. 6, Tuxtla Gutierrez, Chiapas, Mexico ..... (1947) 1953
F Amadon, Dr. Dean, American Museum of Natural History, Central Park West at 79th St., New York 24, New York ..... (1930) 1949
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Anderson, Frank C., Beech and Woodland Ave., Louisville 11, Kentucky .. 1948
Anderson, Frank G., Department of Sociology, University of Maryland, College Park, Maryland 1951
Anderson, G(eorge) Arthur, 601 E. Wapello St., Altadena, California 1949
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Anderson, John M., Winous Point Club, Port Clinton, Ohio 1938
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Anderson, Sydney, Museum of Natural History, Lawrence, Kansas 1955
Andrews, Arthur Allen, 75 Penfield Crescent, Brighton Station, Rochester 10, New York 1924
Andrews, Frances E., 615 Parkview Terrace, Minneapolis 5, Minnesota ... 1954
Andrews, G(eorge) Malcolm, 406 Oak Ridge Drive, R.D. No. 3, Schenectady, New York 1943
Andrews, Mrs. Lydia G(oehmann), Ipswich River Wildlife Sanctuary, Topsfield, Massachusetts 1949
Andrews, Sara Bache (Mrs. Charles B.), 53 Centre St., Clinton, New Jersey 1947
Andrle, Robert F., 59 Blantyre Road, Buffalo 16, New York 1954
Angell, LeRoy E., Route 1, Mankato, Minnesota 1952
Anglin, James P., 957 Dunsmuir Rd., Town of Mount Royal, Quebec, Canada 1943
L Annan, Ormsby, 1059 Chatfield Rd., Winnetka, Illinois 1950
Anthes, Clarence A(lvin), 707 N. Moreland Blvd., Waukesha, Wisconsin ... 1937
Anthony, Jesse D., 722 1st Avenue, East, Grand Rapids, Minnesota 1954
Anthony, Mervil A., 4100 W. 3rd St., Dayton 7, Ohio 1954
Antoniazzi, John F(rancis), Bayberry Lane, Westport, Connecticut 1950
Apfeld, Albert L., South Green St., Tuckerton, New Jersey 1953
Appleberry, Mrs. Edna Lanier, 5 Lake Forest Parkway, Wilmington, North Carolina 1947
Applegate, Wilson G. Hunt, Rhinebeck, New York 1934
EM Arbib, Robert S(imeon), Jr., 231 W. Lena Ave., Freeport, New York (1947) 1955
Archbold, Richard, American Museum of Natural History, 79th St. and Central Park West, New York 24, New York 1930
Arend, Philip H(anford), 21 Buena Vista, Novato, California 1952

Argue, Arthur W., 1040 Boylston St., Boston, Massachusetts 1946
Armitage, Kenneth B(arclay), University of Wisconsin Extension, Wausau, Wisconsin 1952
Armitt, H(erbert) T(homas), 902 Westwood Ave., Westwood, New Jersey . 1950
Armstrong, Joseph Thexton, Jr., Carleton College, Northfield, Minnesota . 1953
Armstrong, Miss Virginia, Old Concord Rd., South Lincoln, Massachusetts 1937
Arnett, Dr. John Hancock, Jr., 6200 Ardleigh St., Philadelphia 38, Pennsylvania 1946
Arnold, Elting, 4914 Dorset Avenue, Chevy Chase 15, Maryland 1934
Arnold, Miss Phoebe G., 55 Emmondsdale Rd., West Roxbury 32, Massachusetts 1953
Arny, Samuel A(ndrew), Apartment 2, 6515 Willston Drive, Falls Church, Virginia 1952
Ashley, Lt. Donn L., c/o OICC, BuDocks Contracts, APO No. 285, New York, New York 1954
Ashton, Randolph, 800 Crown St., Morrisville, Pennsylvania 1938
Atcheson, John G(erald), 2218 Westmount Rd., Calgary, Alberta, Canada . 1948
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Austin, Mrs. Enid K., 1116 Mandana Blvd., Oakland 10, California 1947
Austin, John Brander, 2510 Nashville Ave., New Orleans, Louisiana 1947
F Austin, Dr. Oliver Luther, Jr., ADTIC, Research Studies Institute, Maxwell Air Force Base, Alabama ..... (1925) 1948
EM Austin, Dr. Oliver Luther, Sr., P.O. Box 146, Tuckahoe, Westchester County, New York ..... (1930) 1940
Avent, Miss Carrie, Minter City, Mississippi 1954
EM Axtell, Dr. Harold H(amilton), Buffalo Museum of Science, Buffalo 11, New York ..... (1941) 1951
Ayer, Mrs. N(athan) Edward, 1300 Hillcrest Dr., Pomona, California 1924
Babcock, Charles D., 36th St. and Woodland Ave., Reading, Pennsylvania .. 1953
Babcock, Fred I(rving), Land O'Lakes, Wisconsin 1951
Bacon, Francis L(lewellyn), 22 Waterman Ave., Philadelphia 18, Pennsylvania 1917
Baepler, Donald H., Department of Zoology, University of Oklahoma, Norman, Oklahoma 1955
Baer, Myrtle W., 1237 North Jefferson St., Milwaukee 2, Wisconsin 1942
EM Baerg, Dr. William J., College of Agriculture, University of Arkansas, Fayetteville, Arkansas ..... (1924) 1952
LEM Bagg, Aaron Moore, Farm Street, Dover, Massachusetts ..... (1946) 1951
F Bailey, Alfred M(arshall), Colorado Museum of Natural History, Denver, Colorado ..... (1918) 1941
Bailey, Joe H(arden), Box 393 W.T. Station, Canyon, Texas 1955
L Bailey, John Wendell, 27 Willway Rd., Richmond 21, Virginia 1925
Bailey, Richard, 1107 High Court, Berkeley 8, California 1954
EM Baillie, James L(ittle) Jr., Royal Museum of Zoology and Paleontology, 100 Queen's Park, Toronto, Ontario, Canada ..... (1923) 1935
Baily, Albert Lang, Davenport Public Museum, 804 Putnam Building, Davenport, Iowa 1953
Baily, Fisher C., 1229 Ralston St., Reno, Nevada 1947
Baird, James, Norman Bird Sanctuary, Paradise Rd., Newport, Rhode Island 1947
Baker, B(ernard) W., R.D. No. 1, Judson Rd., Spring Lake, Michigan 1938

EM Baker, John Hopkinson, National Audubon Society, 1130 5th Ave., New York 28, New York ..... (1911) 1949
Baker, Maurice F., Southwestern College, Winfield, Kansas 1954
L Baker, Miss Mildred E., 275 Hillcrest Dr., R. 1, Encinitas, California.... 1947
Baker, Paul S., 21 Woodlot Lane, Huntington, Long Island, New York 1944
EM Baker, Dr. Rollin Harold, The Museum, Michigan State University, East Lansing, Michigan ..... (1939) 1950
Baker, Thomas G., 3722 Rhode Island Ave., Brentwood, Maryland 1954
Baker, William Calvin, 559 Euclid St., Salem, Ohio 1930
Balch, Francis N(oyes), 130 Prince St., Jamaica Plain, Massachusetts 1946
Baldwin, Mrs. Harry Leverett, 6335 Kimbark Ave., Chicago 37, Illinois ... 1924
EM Baldwin, Dr. Paul H., Department of Zoology, Colorado A. and M. College, Fort Collins, Colorado ..... (1947) 1953
Baldwin, Dr. William Grove, Department of Otolaryngology, University of Iowa Hospital, Iowa City, Iowa 1953
Baldwin, William P(lews), Jr., Summerville, South Carolina 1937
Ball, Miss A. Elizabeth, Woodstock Ave., R.F.D., Rutland, Vermont 1947
Ball, Dr. Kathleen E., 8704 112th St., Edmonton, Alberta, Canada 1946
Ball, Robert E(dwin), 1226 Woodland Ave., Northwest, Canton 3, Ohio 1938
Ball, Stanley C(rittenden), Peabody Museum of Natural History, Yale University, New Haven, Connecticut 1942
Ballance, Leon G., Lake Landing, North Carolina 1952
Ballard, Mrs. Buena B., 612 N. 25th Ave., Hattiesburg, Mississippi 1955
Balsom, Mrs. Amos P., 2209 E. Stratford Court, Milwaukee 11, Wisconsin 1947
Banta, Edna, Mary Gray Bird Sanctuary, R.R. No. 6, Connersville, Indiana 1954
Barbehenn, Kile R., 7114 Sellers Ave., Upper Darby, Pennsylvania 1954
Barber, D(avid) H(enry), The Rectory, Mells, near Frome, Somerset, England 1948
Barber, Herb(ert) K(neeshaw), 22 North 4th St., Niles, Michigan 1953
Barber, Yates Middleton, Jr., Box 117, Wrightsville Beach, North Carolina . 1948
Barbour, Dr. Roger W., Department of Zoology, University of Kentucky, Lexington, Kentucky 1937
Barkalow, Frederick S(chenck), Jr., 2510 Wade Ave., Raleigh, North Carolina 1938
Barlow, Henry Hoyt, R.D. No. 1, Califon, New Jersey 1954
Barnard, Ellsworth, 50 Federal St., Brunswick, Maine 1949
HL Barnes, Claude Teancum, 359 Tenth Ave., Salt Lake City, Utah 1908
Barnes, Mrs. Ruth, 173 Myrtle St., Shelton, Connecticut 1944
Barnett, A. Houston, 341 South Cañon Dr., Beverly Hills, California 1954
Barrett, Charles H(oratio) M(atchett), 1339 Valley Place, S.E., Washington 20, D.C. 1912
Barrett, Vernon, 1300 Chelten Way, South Pasadena, California 1953
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Barry, Thomas Woodams, 1744 Edgemere Dr., Rochester 12, New York ... 1954
Bartel, Karl E(mil) (Edgar), 2528 W. Collins St., Blue Island, Illinois 1934
EM Bartholomew, Dr. George A(delbert), Jr., Department of Zoology, University of California, Los Angeles 24, California ..... (1941) 1949
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Bartlett, Guy, 1053 Parkwood Blvd., Schenectady 8, New York 1932
Bartlett, Dr. L(awrence) M(atthews), Zoology Department, University of Massachusetts, Amherst, Massachusetts 1952
Barton, Roger Avery, 22 Arlington Ave., Caldwell, New Jersey 1952
Bartram, Edwin B(unting), Bushkill, Pike Co., Pennsylvania 1913
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Baumgarten, Dr. Henry E(rnest), Avery Laboratory, University of Nebraska, Lincoln 8, Nebraska 1953
EM Baumgartner, Dr. Frederick M(ilton), Department of Zoology, A. and M. College, Stillwater, Oklahoma ..... (1930) 1953
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Beal, George, 1009 Pegg Rd., East Point, Georgia 1954
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F Beebe, Dr. (Charles) William, Zoological Park, New York 60, New York ..... (1897) 1912
EM Beecher, William John, Chicago Natural History Museum, Roosevelt Rd. and Field Drive, Chicago 5, Illinois ..... (1937) 1950
Beer, James R(obert), Division of Entomology and Economic Zoology, University of Minnesota, St. Paul 1, Minnesota 1939
Beeton, Alfred M., 214 North First St., Ann Arbor, Michigan 1954
F Behle, Dr. William Harroun, Department of Biology, University of Utah, Salt Lake City, Utah ..... (1934) 1951
Behrend, Fred William, 607 Range St., Elizabethton, Tennessee 1954

Beidleman, Richard G(ooch), Zoology Department, Colorado A. and M. College, Fort Collins, Colorado 1948
Belcher, Paul E(ugene), 98 Grandin Rd., Akron 13, Ohio 1937
Belkin, Daniel Arthur, 6255 Drexel Ave., Los Angeles 48, California 1955
L Belknap, John Balcom, 92 Clinton St., Gouverneur, New York 1927
EM Bellrose, Frank, Jr., 334 E. Adams St., Havana, Illinois ..... (1934) 1947
L Belt, Charles B(anks), 233 Broadway, New York 7, New York 1950
Belton, William, 9009 Kensington Parkway, Chevy Chase 15, Maryland 1947
Bemont, Leslie E., 710 University Ave., Endwell, New York 1953
Benckenstein, Mrs. Eunice R(obinson), P.O. Box 720, Orange, Texas 1949
Benjamin, Gilbert G., Jr., Apartment 105, 2304 Blueridge Ave., Silver Spring, Maryland 1947
Bennett, Cha(rle)s H(erbert), 80 Belmont Ave., Ottawa, Ontario, Canada ... 1948
Bennett, Gerald M., 278 King St., E., Apt. 1, Cobourg, Ontario, Canada .. 1955
Bennett, Holly R(eed), Hornblower and Weeks, 134 S. LaSalle St., Chicago 3, Illinois 1952
Bennett, Joseph A(lexander), Jr., 28 Berkeley Rd., Maplewood, New Jersey . 1951
EM Bennett, Dr. Logan Johnson, Pennsylvania Game Commission, Harrisburg, Pennsylvania ..... (1934) 1946
Bennett, Walter Waldo, 7828 Santa Monica Blvd., Hollywood 46, California .. 1924
Benson, Seth B(ertram), 645 Coventry Rd., Berkeley 7, California 1928
Bent, George P. II, Lake Ave., Greenwich, Connecticut 1950
Benton, Allen H(aydon), New York College for Teachers, Albany, New York. 1949
EM Berger, Andrew J(ohn), Department of Anatomy, East Medical Building, University of Michigan, Ann Arbor, Michigan ..... (1948) 1952
Berger, Daniel David, 510 E. MacArthur Rd., Milwaukee 17, Wisconsin.... 1954
Berger, Jacques, Apt. 7, 109 E. Chalmers St., Champaign, Illinois..... 1955
LEM Bergstrom, E(dward) Alexander, 37 Old Brook Rd., W. Hartford 7, Connecticut ..... (1939) 1954
Berkey, Glen L(eroy), 22 S. State St., Rittman, Ohio 1949
Berkowitz, Albert C(larence), 517 58th St., Des Moines 12, Iowa 1948
Bernath, Ernest L., Casilla 13198, Santiago de Chile 1955
Berry, William David, Box 1992, Fairbanks, Alaska 1954
Besson, E(saie) John, 1839 Ingleside Terr., N.W., Washington 10, D.C. ... 1947
Beston, Henry, Chimney Farm, Nobleboro, Maine 1950
Biaggi, Dr. Virgilio, Jr., Biology Department, University of Puerto Rico, College of Agriculture and Mechanic Arts, Mayaguez, Puerto Rico .. 1944
Bicket, John Willis, 2905 Eschol Ave., Zion, Illinois 1955
L Bigelow, Mrs. Archibald Pierce, 270 Wayne Ave., Oakland, California 1919
Biggs, Joseph D(aniel), 6624 First St., N.E., Washington 12, D.C. 1949
Bilby, H. A., 2, Sunnyside Cottages, High Street, Harlington, Hayes, Middlesex, England 1947
Binford, Laurence C(harles), Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1954
Bingham, Millicent Todd, 1661 Crescent Place, Washington 9, D.C. 1949
Bingham, Richard S(tephen), 1020 Hurst St., Chattanooga 11, Tennessee ... 1955
Birdseye, Clarence, Eastern Point Blvd., Gloucester, Massachusetts 1948
Birkeland, Henry, Roland, Iowa 1933
Biswas, Biswamoy, Zoological Survey of India, Indian Museum, 27 Chowringhee, Calcutta 13, India 1948
Black, Dr. C(harles) Theodore, R.R. No. 1, Box 480, East Lansing, Michigan 1933
Blackstone, Robert E., 10363 Calvin Ave., Los Angeles 25, California 1954

HL	Blackwelder, Eliot, P.O. Box N, Stanford, California		1895
	Blades, Mrs. Herbert, 1908 W. Gilpin Drive, Willow Run, Wilmington 5, Delaware		1955
LRM	Blain, Dr. Alexander William, 1028 Berkshire Rd., Grosse Pointe Park 30, Michigan	(1902)	1953
RM	Blake, Dr. Charles Henry, Lincoln, Massachusetts	(1946)	1950
F	Blake, Emmet Reid, Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Illinois	(1933)	1952
	Blake, Dr. Sidney Fay, 3416 North Glebe Rd., Arlington, Virginia		1923
	Blanchard, Harold H(ooper), 32 Calumet Rd., Winchester, Massachusetts		1939
L	Blauvelt, Hiram B.D., 637 Kinderkamack Rd., Oradell, New Jersey		1948
	Bliese, John C(arl) W(illiam), Biology Dept., Nebraska State Teachers College, Kearney, Nebraska		1951
L	Bleitz, Donald L., Box 269, Los Angeles 28, California		1947
	Blomquist, Eric G., 2926 N. 76th Ave., Chicago 35, Illinois		1954
L	Bloomer, Wilson C., 107 Myrtle Ave., Newark, New York		1955
	Blossom, Philip M(oss), 10969 Rochester Ave., Westwood Hills, Los Angeles 24, California		1948
	Blouch, Ralph I(rving), 532 LaSalle Blvd., Lansing, Michigan		1949
	Boag, David A., 9206 118 St., Edmonton, Alberta, Canada		1955
L	Bock, Walter, Biological Laboratories, Harvard University, Cambridge 38, Massachusetts		1952
	Bodsworth, Fred, 294 Beech Ave., Toronto 8, Ontario, Canada		1954
	Boldtmann, John Karl, 132 Lincoln St., Hackensack, New Jersey		1949
F	Bond, James, Academy of Natural Sciences, 19th and Race Sts., Philadelphia, Pennsylvania	(1923)	1946
EM	Bond, Richard M(arshall), St. Croix, U.S. Virgin Islands	(1939)	1945
L	Bond, Richard R(andolph), Department of Biology, Salem College, Salem, West Virginia		1952
	Bonney, Christine A., (Mrs. Guy E.), 518 E. Monroe St., c/o Security Federal Savings & Loan Association, Springfield, Illinois		1949
	Boocock, Philip M.B., 53 Colvin Ave., Buffalo 16, New York		1946
	Boomhower, Mrs. Robert, 303 Arabian Rd., Palm Beach, Florida		1926
	Booth, Dr. Ernest S(heldon), Department of Biology, Walla Walla College, College Place, Washington		1946
	Booth, Mrs. Robert V.D., 1085 Bank St., Painesville, Ohio		1951
	Bordner, Miss Dorothy Louise, 926 W. Beaver Ave., State College, Pennsylvania		1953
	Borell, A(drey) E(dwin), P.O. Box 1377, Oklahoma City, Oklahoma		1927
	Borror, Dr. Donald J(oyce), Department of Zoology and Entomology, Ohio State University, Columbus, Ohio		1936
	Botsford, Miss E. Frances, Connecticut College, New London, Connecticut		1947
EM	Boulton, (Wolfrid) Rudyerd, Jr., 3234 Reservoir Rd., N.W., Washington 7, D.C.	(1915)	1929
	Bourns, T.K.R., Department of Zoology, Rutgers University, New Brunswick, New Jersey		1953
	Bouslog, Dr. John S(amuel), 304 Republic Bldg., Denver 2, Colorado		1930
L	Bovey, Martin K., Chelmsford, Massachusetts		1942
HL	Bowdish, Mrs. B(eecher) S., (Christabel Everett), Demarest, New Jersey		1902
HLRM	Bowdish, B(eecher) S(coville), Demarest, New Jersey	(1891)	1934
	Bowen, Richard, 703 Pearse Rd., Swansea, Massachusetts		1947
	Bowen, Robert M(arvin), 5009 Leeds Ave., Halethorpe 27, Maryland		1947

Bower, Mrs. F. L., Lee's Hill Road, R.D. No. 1, Basking Ridge, New Jersey 1954
Bowers, Darl Eugene, Museum of Vertebrate Zoology, Berkeley 4, California 1953
Bowers, Glenn L(ee), 28 Stewart Place, Box 222, Shippensburg, Pennsylvania 1951
L Bowers, Jim M., 595 N. 15th St., Salem, Oregon 1953
Bowman, Robert I., Museum of Vertebrate Zoology, University of California, Berkeley 4, California 1954
Boyd, Dr. Elizabeth M(argaret), Zoology Department, Mount Holyoke College, South Hadley, Massachusetts 1948
Boyd, Hugh J(ames), The New Grounds, Slimbridge, Gloucester, England .. 1949
Boyd, John C., Le Rosey School, Rolle, Switzerland 1954
Boyer, G(eorge) F(rederick), R.R. No. 1, West Sackville, New Brunswick, Canada 1946
EM Brackbill, Hervey (Groff), 2620 Poplar Drive, Baltimore 7, Maryland (1940) 1949
Bradburn, Donald Muir, 461 Pine St., New Orleans, Louisiana 1949
Bradley, Miss Anna Penfield, 352 Whitney Ave., New Haven, Connecticut .. 1933
Bradley, Leonard J(oseph), Horseshoe Rd., Wilton, Connecticut..... 1946
Brainerd, John W., Springfield College, Springfield, Massachusetts 1938
Braman, Myrtle, 206 W. Stayton Ave., Victoria, Texas 1951
Branch, Mrs. Margaret G., 1324 Wells St., Ann Arbor, Michigan 1954
L Brand, Mrs. Albert R(ich), 700 Stewart Ave., Ithaca, New York 1934
Brassard, Dr. J. A., Director, Quebec Zoological Garden, Charlesbourg, Quebec, Canada 1954
Braunberns, James E(dward), Eighteen Mile Creek Rd., Derby, New York . 1949
Brauner, Joseph, 11233 Van Buren Ave., Los Angeles 44, California 1933
L Brecher, Leonard C(harles), 1900 Spring Drive, Louisville 5, Kentucky ... 1946
F Breckenridge, Dr. Walter John, Museum of Natural History, University of Minnesota, Minneapolis, Minnesota ..... (1926) 1950
Breiding, George H(erbert), Oglebay Park, Wheeling, West Virginia 1944
Brettle, Arthur C., 159 Pleasant Ave., Hamburg, New York 1954
Brewer, Harvey W., 270 Herbert Ave., Closter, New Jersey 1954
Brigham, Edward Morris, Jr., Kingman Museum of Natural History, Battle Creek, Michigan 1942
Brigham, H(erbert) Storrs, Jr., R.F.D., Fremont, New Hampshire 1946
Brinckerhoff, Remsen, 156 Sherwood Pl., Englewood, New Jersey 1947
Bristow, Miss Alice A(ndrews), Silvermine Rd., Norwalk, Connecticut 1949
Bristow, Harry S(herman), Jr., 210 Washington Ave., Cedars, Wilmington, Delaware 1940
Brittan, Martin Ralph, Department of Biology, Sacramento State College, Sacramento, California 1947
Brock, Jean A.M., 9752 Old Warson Rd., St. Louis 17, Missouri 1946
Brockner, Winston William, 63 Ardmore Place, Buffalo 13, New York 1952
EM Brodkorb, Dr. (William) Pierce, Department of Biology, University of Florida, Gainesville, Florida ..... (1925) 1937
Brodrick, Harold J(ames), Big Bend National Park, Texas 1935
Brody, Dr. Gerald L(ee), Department of Surgery, University Hospital, Ann Arbor, Michigan 1951
EM Broley, Charles Lavelle, Delta, Ontario, Canada ..... (1926) 1949
Brookfield, Charles M(ann), Box 284, Coconut Grove, Miami 33, Florida .. 1951
F Brooks, Maurice Graham, Division of Forestry, West Virginia University, Morgantown, West Virginia ..... (1930) 1950

Brooks, Winthrop Sprague, Kings Highway, Orleans, Massachusetts (1907) 1917
Brooman, Edwin William, 590 River St., East, Prince Albert, Saskatchewan, Canada 1943
Brooman, R(onald) C(harles), c/o Bank of Montreal, Kitchener, Ontario, Canada 1931
Broun, Maurice, Hawk Mountain Sanctuary, R.D. No. 2, Kempton, Pennsylvania ..... (1922) 1948
Brower, Dr. Auburn E(dmond), 5 Hospital St., Augusta, Maine 1951
Brown, Clarence D(uvall), 222 Valley Rd., Montclair, New Jersey 1937
Brown, Jerram L(efevre), 19 Hitchcock Rd., Amherst, Massachusetts 1949
Brown, John Hodgen, 2450 Olive St., Denver 7, Colorado 1954
Brown, J(ohn) Warner, Oatka Farm, Scottsville, New York 1951
Brown, Mortimer F(ayette), Overlook Rd., Westport, Connecticut 1951
Brown, N(orman) Rae, Faculty of Forestry, University of New Brunswick, Fredericton, New Brunswick, Canada 1946
Brown, Onslow, 22 Plymouth St., Norwich, New York 1955
Brown, Roy Melton, Route 2, Chapel Hill, North Carolina 1954
Brown, W. L., 173 Hillhurst Blvd., Toronto, Ontario, Canada 1953
Brown, Wendell, 5224 Blake Rd., Minneapolis, Minnesota 1949
Brown, William James, 4129 Dorchester St., West, Westmount, Quebec, Canada 1908
Brown, Woodward H(art), 4815 Ingersoll Ave., Des Moines 12, Iowa 1950
Browne, Andrew C., 350 Delmas Ave., San Jose, California 1952
Bruce, James A(ddison), 565 E. Spring St., Wooster, Ohio 1952
Bruestle, Bertram G(eorge), Old Lyme, Connecticut 1929
Brumbaugh, Chalmers Sherfey, 317 St. Dunstan's Rd., Homeland, Baltimore 12, Maryland 1916
Brummett, R. C., 514 Dallas Drive, Carlsbad, New Mexico 1954
Bruns, Dr. Herbert, Wurzburgerstr. 74, Wurzburg, Versbach, Germany .. 1955
Bruns, James Henry, St. Francisville, Louisiana 1942
Bruton, J(ames) D(eWitt), Jr., P.O. Box No. 33, Plant City, Florida 1949
Bryant, Frederick C(opeland), Jr., 16 Wood End Lane, Bronxville, New York 1947
Bryant, Dr. Harold Child, 245 Glorietta Blvd., Orinda, California . (1913) 1918
Brydon, Norman F., Essex Rd., Essex Fells, New Jersey 1954
Bryens, Oscar McKinley, 231 South Main St., Three Rivers, St. Joseph Co., Michigan 1924
Buchanan, Charles M(cCay), 104 W. Melrose Ave., Baltimore 10, Maryland 1949
Buchanan, Forest W(endall), Amsterdam, Ohio 1944
Buchheister, Carl W(illiam), 1239 Madison Ave., New York 28, New York . 1939
Buckalew, John H(erbert), 70-1/2 Lake Ave., Wolcott, New York 1948
Buckland, George (Henry Edward), Route No. 1, Batavia, New York 1948
Bucknell, Donald (Needham), 134 Wonham St., Ingersoll, Ontario, Canada . 1949
Bull, John L., Jr., 1148 Virginia St., Far Rockaway 91, New York 1947
Bullock, Dillman Samuel, Casilla 2D, Angol, Chile 1920
Bundick, Miss Harriet E(llen), 1465 Columbia Rd., N.W., Washington 9, D.C. 1924
Bunnell, John R., 1920 Baltimore Ave., Cincinnati 25, Ohio 1955
Bunting, Walter Kenneth, 1203 W. Washington Ave., Jackson, Michigan ... 1953
Burch, Rose Lenora (Mrs. John Q.) 4206 Halldale Ave., Los Angeles 62, California 1947
Bures, Joseph A., 148 N. 3rd St., West Newton, Pennsylvania 1944

Burk, Dr. Myrle M., R.R. No. 2, Waterloo, Iowa 1953
Burkhart, Mrs. Elizabeth Z(immerman), Box 28, Route 1, Emmaus, Pennsylvania 1949
F Burleigh, Thomas Dearborn, School of Forestry, University of Idaho, Moscow, Idaho ..... (1913) 1948
Burmeister, Melvin W(illiam), 5753 Dakin St., Chicago 34, Illinois 1948
Burner, Charles C(raig), 1410 S. Olive, Pittsburg, Kansas 1946
Burner, Miss Florence H., 5350 Reisterstown Rd., Baltimore 15, Maryland 1953
Burnett, Miss Frances L., Proctor St., Manchester, Massachusetts 1946
Burns, Robert D(avid), Department of Zoology, M.S.U., East Lansing, Michigan 1952
Burns, Robert K(yle), Carnegie Laboratory of Embryology, Wolfe and Madison Sts., Baltimore 5, Maryland 1947
Burr, Dr. Irving W(ingate), 265 Littleton St., West Lafayette, Indiana 1939
Burrows, George Howard II, R.F.D. No. 1, New Market, New Hampshire . 1951
Burton, Donald E., 171 Strathearn Rd., Toronto 10, Ontario, Canada 1955
Burton, E(dward) Milby, The Charleston Museum, Charleston, South Carolina 1929
Burtt, Harold E., Department of Psychology, Ohio State University, Columbus 10, Ohio 1952
Bushar, Don Mylo, 2806 Military Rd., Sioux City 17, Iowa 1954
Bushman, John B., Ecological Research, University of Utah, Dugway, Utah 1948
EM Buss, Prof. Irven O(tto), 804 Alpha Rd., Pullman, Washington ..... (1939) 1954
Butchart, G. Reeves, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1950
Butler, Mrs. Christella Campbell, 3 Parkland Ave., Parkland, Pennsylvania 1946
Butwick, Albert N(orman), R.R. 2, Hamilton, Ontario, Canada 1951
Buxton, Robert B(urns), Box 427, Damariscotta, Maine 1949
Byrd, Mitchell A(gee), 400 Third Ave., Franklin, Virginia 1950
Byron, Richard, Blakeley Corners Rd., East Aurora, New York 1949
Cadbury, Joseph M(oore), 108 W. Phil-ellena St., Philadelphia 19, Pennsylvania 1940
Cade, Tom(my) (Joe), 526 Gayley, Los Angeles 24, California 1950
Cadwalader, John, Jr., c/o Mrs. T.G. Aspinwall, 104 W. Mermaid Lane, Philadelphia 18, Pennsylvania 1940
Cady, Dr. Walter G(uyton), 3350 Calvert Rd., Pasadena 8, California 1950
EM Cahalane, Victor H(arrison), New York State Museum, Albany 1, New York ..... (1934) 1946
Cain, Mrs. James R., Sunnyside, Georgia 1947
Cairns, John MacKay, 519 Plumosa Ave., Clearwater, Florida 1926
Calder, David R., 35 Meyrick Ave., Durban, Natal, Union of South Africa . 1955
Caldwell, Dorothy W., 73 Foster St., Littleton, Massachusetts 1939
Caldwell, Larry D., 124 Janet S.E., Grand Rapids, Michigan 1954
Calef, Robert T., 734 East University, Ann Arbor, Michigan 1954
Callahan, Philip Serna, 70-A Hill Top Courts, Manhattan, Kansas 1953
Calvert, Earl Wellington, R.R. No. 2, Country Home, Lindsay, Ontario, Canada 1936
Calvin, Robert L(eal), R.R. No. 3, Fairhill Drive, New Castle, Pennsylvania 1950
Calvo, Manuel J., 4101 Dresden St., Kensington, Maryland 1948
Campbell, J(ohn) D(avid), 1222 W. State St., Geneva, Illinois 1944

	Campbell, John M(artin), R.R. No. 1, Selah, Washington		1951
EM	Campbell, Louis W(alter), 4531 Walker Ave., Toledo 12, Ohio	(1929)	1939
	Campbell, Mildred F., 29 North Hawthorne Lane, Indianapolis 19, Indiana		1954
	Campbell, Mrs. Elizabeth W. Crozer, Route 2, Box 871-A, Tucson, Arizona		1947
	Camras, Dr. Sidney, 6130 N. Claremont, Chicago 45, Illinois		1937
	Cannon, Jerauld C(arlyle), Rt. 6, Box 190, Los Altos Road, Tucson, Arizona		1952
	Cant, Gilbert, 316 Beach Ave., Mamaroneck, New York		1946
	Cantor, Irving, 206 West 104 St., New York 25, New York		1952
	Cardiff, Eugene E(lvin), R.F.D. No. 1, Rialto 2, California		1949
	Carl, George Clifford, Provincial Museum, Victoria, British Columbia, Canada		1941
	Carl, Harry G., 2304 Davie St., Davenport, Iowa		1949
	Carlin, Sylvia, 105 Winthrop St., Brooklyn 25, New York		1955
	Carmony, D. Duane, 223 S. Bryan, Bloomington, Indiana		1954
LEM	Carnes, Mrs. Herbert E., 25 Kenwood Rd., Tenafly, New Jersey	(1944)	1955
	Carpenter, Dr. Charles C., Department of Zoological Sciences, University of Oklahoma, Norman, Oklahoma		1952
	Carpenter, Max M(aynard), Route No. 1, Dayton, Virginia		1948
EM	Carriker, M(elbourne) A(rmstrong), Jr., Apartado Nac. No. 82, Popayan, Colombia, South America	(1912)	1933
	Carroll, Robert P., Department of Biology, Virginia Military Institute, Lexington, Virginia		1938
	Carson, Hampton L(awrence), Jr., Route No. 3, Box 665, Creve Coeur, Missouri		1935
	Carson, L(enwood) B(allard), 1306 Lincoln, Topeka, Kansas		1948
	Carter, Charles E(dward), 1339 30th St., Orlando, Florida		1951
	Carter, Dennis L., 715 Ohio St., Webster City, Iowa		1954
	Carter, Dr. Frances, Women's Faculty Club, University of California, Berkeley 4, California		1954
	Carter, T(homas) Donald, American Museum of Natural History, Central Park West at 79th, New York, New York		1921
EM	Cartwright, B(ertram) W(illiam), Ducks Unlimited, 201 Canada Bank of Commerce, Winnipeg, Manitoba, Canada	(1924)	1952
	Cartwright, William J(ames), Williamstown, Massachusetts		1920
	Case, Ralph E., Bluff Head Farm, Guilford Road, Durham, Connecticut		1949
	Casey, Mrs. Claude L., 491 Ockley Dr., Shreveport, Louisiana		1952
	Cassel, Dr. J(oseph) Frank(lin), Zoology Department, North Dakota Agricultural College, Fargo, North Dakota		1935
	Castle, Dr. Gerald H(arvey), 1404 Union Central Bldg., Cincinnati 2, Ohio.		1950
	Castle, Peter Watson, 42 Walker St., Cambridge 38, Massachusetts		1953
	Caswell, Edwin B., 5644 North Sultana Ave., Temple City, California		1952
	Caswell, Herbert H(all), Jr., Department of Natural History, Southeastern Michigan State College, Ypsilanti, Michigan		1952
	Cayouette, Raymond, Quebec Zoological Garden, Charlesbourg, R.R. No. 2, Quebec, Canada		1936
L	Chalif, Edward Louis, Barnsdale Rd., Short Hills, New Jersey		1935
	Chamberlain, Carlyle D(eHaven), 2112 Eastview Ave., Louisville 5, Kentucky		1952
EM	Chamberlain, Edward Burnham, c/o B.R. Chamberlain, 604 Johnston Bldg., Charlotte, North Carolina	(1923)	1949

Chamberlain, Norman A(llison), "Critter Hill", Route No. 1, Matthews, North Carolina 1950
Chamberlain, Samuel Renick, Refugio, Texas 1952
LF Chambers, W(illie) Lee, Robinson Rd., Topanga, California ..... (1907) 1953
Chapelle, Major Francis O., Medical Field Service School, Fort Sam Houston, Texas 1954
F Chapin, Dr. James (Paul), c/o IRSAC, Boîte Postale 217, Bukavu, Kivu, Belgian Congo ..... (1906) 1921
Chapin, Dr. John L(adner), Physiology Dept., University of Colorado Medical School, Denver, Colorado 1950
Chapin, Ruth Trimble, (Mrs. James Paul) c/o IRSAC, B.P. 217, Bukavu, Kivu, Belgian Congo 1932
Chapman, Dr. Floyd Barton, 392 Walhalla Rd., Columbus 2, Ohio 1936
Chapman, Herman Floraine, 712 S. Dakota Ave., Sioux Falls, South Dakota 1947
Chapman, Lawrence B(oylston), R.F.D. Box 90, Hubbardston, Massachusetts 1930
Chase, Henry B(right), Jr., 517 Decatur St., New Orleans 16, Louisiana ... 1948
Chase, Warren James, Alexandria, Nebraska 1952
Cheek, John A(damsen), Jr., Buckhorn, Kentucky 1952
Cheshire, W(illiam) F(rancis), 4 Waverly Rd., Pointe Claire, Quebec, Canada 1950
Chew, Dr. Robert M., Department of Zoology, University of Southern California, Los Angeles 7, California 1953
Choate, Dr. Ernest A., 411 Rodman Ave., Jenkintown, Pennsylvania 1943
Christian, John J(ermyn), Naval Medical Research Institute, Bethesda 14, Maryland 1948
Church, Ronald L., 122 Eleventh St., Pacific Grove, California 1953
Churchill, Mrs. L. W., 10 Juniper Rd., Belmont 78, Massachusetts 1951
Chute, Richard S(ears), 78 Upland Rd., Brookline 46, Massachusetts 1950
Clancey, Phillip Alexander, Durban Museum and Art Gallery, Durban, Natal, South Africa 1951
Clapp, Richard L(owell), College of Medical Evangelists, 1720 Brooklyn Box 10, Los Angeles 33, California 1952
Clark, Mrs. Ben P., 948 Forrest Ave., Gadsden, Alabama 1955
Clark, Fanny Dwight, (Mrs. Grenville), Dublin, New Hampshire 1940
Clark, George R(oberts), W. Valley Green Rd., Flourtown, Pennsylvania .. 1926
Clark, Gregory, 119 Crescent Rd., Toronto, Ontario, Canada 1951
Clark, Harold Willard, Department of Biology, Pacific Union College, Angwin, California 1946
Clark, Mrs. Thomas Sanders (Josephine A.), Box 382, Tryon, North Carolina 1952
EM Clarke, C(harles) H(enry) D(ouglas), c/o F. & W. Div., Department of Lands and Forests, Parliament Buildings, Toronto 2, Ontario, Canada ..... (1931) 1947
Clarke, Charles E(verett), 76 Ashland St., Medford 55, Massachusetts 1907
L Clarke, William S., Jr., Box 167, State College, Pennsylvania 1947
L Clarkson, Elizabeth Barnhill, (Mrs. Edwin O.), Wing Haven, 248 Ridgewood Ave., Charlotte, North Carolina 1943
Clattenburg, Albert E(dwin), Jr., F.S.O. Nice, c/o Department of State, Washington 25, D.C. 1929
Clausen, Dr. Robert T., Department of Botany, Cornell University, Ithaca, New York 1928

Clay, C. I., Box 353, Eureka, California 1950
L Cleaves, Howard H(enderson), 8 Maretzek Court, Staten Island 9, New York 1907
Cleghorn, James Donald, Zoology Division, Redpath Museum, McGill University, Montreal 2, Canada 1937
Clement, Roland C(harles), 26 Brookfield Rd., Riverside 15, Rhode Island 1935
L Clements, H(iram) Everest, 49 Stoneham Rd., Rochester 10, New York ... 1949
Clevenger, Sarah B., 717 So. Henderson St., Bloomington, Indiana 1954
Clotfelter, J(ames) W(ayman), 121 Duncan Ave., Paris, Kentucky 1948
Clough, Gari C(onde), S. Plank Rd., R.D. No. 3, Newburgh, New York ... 1948
Clow, Miss Marion (Frances), P.O. Box 163, Lake Forest, Illinois 1929
Cobb, Boughton, 180 Madison Ave., New York, New York 1948
Cobb, Dr. Stanley, 34 Fernald Drive, Cambridge 38, Massachusetts 1909
Coble, Miss Mary Ferguson, 1357 N. Stanley, Hollywood 46, California ... 1953
Coe, Mrs. Helen (Carhart) M., 101 Jefferson Drive, Clairton, Pennsylvania 1954
EM Coffey, Ben Barry, Jr., 672 N. Belvedere, Memphis, Tennessee .... (1929) 1950
Coffin, Mrs. Francis Hopkinson, 1512 Jefferson Ave., Scranton, Pennsylvania 1921
Coggeshall, Robert D(wight), Billington Rd., East Aurora, New York 1954
Coggins, Herbert Leonard, 2764 Filbert St., San Francisco, California ... 1898
EM Cogswell, Howard L(yman), Department of Biological Sciences, Mills College, Oakland 13, California ..... (1943) 1952
Cohn, Dr. Zanvil A., 115 Stuart Ave., Amityville, L.I., New York..... 1955
Cole, (Margaret) Evelyn, Box 433, Greensboro College, Greensboro, North Carolina 1950
L Cole, Richard D(aniel), 625 Valley Lane, Towson 4, Maryland 1951
Cole, Mrs. Whiteford R., Jr., 1746 Sulgrave Rd., Louisville 5, Kentucky . 1955
EM Collias, Dr. Nicholas E(lias), Illinois College, Jacksonville, Illinois (1950) 1954
Collier, Gerald, 3634 N. Muscatel Ave., Rosemead, California 1953
Collins, Mrs. D(aniel) S., (Kathryn W.), 603 Thomas Ave., Jonesboro, Arkansas 1950
L Collins, Henry Hill, Jr., 136 Parkview Ave., Bronxville 8, New York 1923
Collister, Allegra Edith (Mrs. Carl), 706 Hover Rd., Longmont, Colorado 1949
Colton, Harold S., Coyote Range, Box 601, Flagstaff, Arizona 1944
Colwell, Frederick A(ndrew), R.F.D. No. 2, Collegeville, Pennsylvania .. 1949
Colwell, Mrs. J. Irving, 3825 E. Highland Drive, Seattle 2, Washington ... 1954
Coman, Dr. Dale Rex, 4625 Osaga Ave., Philadelphia 43, Pennsylvania ... 1942
Comby, Julius Hugh, 10044 E. Kratt Lane, Whittier, California..... 1943
Comfort, James F(rank), 27 N. Iola Dr., Webster Groves 19, Missouri ... 1951
Compton, Miss Dorothy M(ay), 22 Wilton St., Princeton, New Jersey..... 1931
Compton, Dr. Lawrence V(erlyn), Biology Division, Soil Conservation Service, Washington 25, D.C. 1926
L Conboy, Mrs. John William, 417 Studebaker St., Mishawaka, Indiana 1954
Cone, Edward T(oner), 1 Queenston Place, Princeton, New Jersey 1933
Congdon, Dr. Russell T(hompson), 122 S. Cleveland, Wenatchee, Washington 1947
Conkey, John Houghton, 11 Chestnut St., Ware, Massachusetts 1929
Conn, Robert C., 755 Ross Lane, Bound Brook, New Jersey 1945
Conway, Albert E(dward), Route 4, Easton, Pennsylvania 1938
Conway, William G(aylord), St. Louis Zoological Gardens, Forest Park, St. Louis 10, Missouri 1951
L Cooch, F(rederick) Graham, 685 Echo Dr., Ottawa, Ontario, Canada 1952

Cook, (William) Bolton, 20 Irenhyl Ave., Port Chester, New York 1929
Cook, Fannye A(ddine), Apt. 4B, 827 North State St., Jackson, Mississippi 1924
Cook, Robert E(dwin), Main St., Elverson, Pennsylvania 1950
LEM Cooke, Miss May Thacher, Apt. 401, 1400 Fairmount St., N.W., Washington, D.C. ..... (1915) 1926
Coolidge, Oliver H., Broad Brook Rd., Bedford Hills, New York 1928
Coolidge, Philip T(ripp), Box 102, Bangor, Maine 1919
L Coombes, Robert A(rmitage) H(amilton), British Museum of Natural History, Tring, Hertfordshire 1935
HL Cope, Francis R(eeve), Jr., Dimock Post Office, Pennsylvania 1892
Cope, James B(onwill), Earlham College, Richmond, Indiana 1948
Copeland, Manton, 88 Federal St., Brunswick, Maine 1900
Corbett, Kenneth Blair, 704 N. Pine St., Lancaster, Pennsylvania 1947
Corey, Eben F(ox), Barrett's Mill Rd., Concord, Massachusetts 1949
Cork, H(enry), 73 Queenswood Rd., Forest Hill, London, Southeast 23, England 1948
Cormier, Francis, 401 Cornell St., Ithaca, New York 1952
F Cottam, Dr. Clarence, Welder Wildlife Foundation, P.O. Box 1104, Sinton, Texas ..... (1928) 1942
Cottrell, G(eorge) W(illiam), Jr., 70 Lakeview Ave., Cambridge 38, Massachusetts 1938
Cottrille, Dr. W(illiam) Powell, 6075 Brown's Lake Rd., Jackson, Michigan 1951
Cottrille, Mrs. W. Powell, 6075 Brown's Lake Rd., Jackson, Michigan ... 1953
Coursen, C(harles) Blair, 8200 S. Hayne Ave., Chicago 20, Illinois 1928
Coven, Glenn E., Old Amwell Rd., Neshanic, New Jersey 1953
Covert, James L(ee), 256 Ridgeway Corner, Louisville 7, Kentucky 1949
EM Cowan, Ian McT(aggart), Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada ..... (1939) 1941
Cowan, Jack Wesley, 515 6th St., N.W., Puyallup, Washington 1954
Cowan, John B(etts), Gray Lodge Refuge, Gridley, California 1951
Cox, George Norton, 137 Park Ave., Bay Head, New Jersey 1955
Cox, Sam M(adison), 2624 Minnesota Ave., Duluth 11, Minnesota 1947
Coxon, Thomas T., 2502 Leon Ave., Vero Beach, Florida 1954
Coy, Roy E(arl), St. Joseph Museum, 11th and Charles, St. Joseph 13, Missouri 1951
Cragg, Hoyt J., 4451 Tupelo St., Baton Rouge, Louisiana 1947
Crandall, John DeW(itt), R.D. No. 1, Cohoes, New York 1952
F Crandall, Lee Saunders, New York Zoological Park, 185th St. and Southern Blvd., New York, New York ..... (1909) 1951
L Crane, Cornelius, 240 Central Park South, New York 19, New York 1930
Crawford, Alan, Jr., White Horse Rd., Devon, Pennsylvania 1949
Crawford, Mary Newell, White Horse Rd., Devon, Pennsylvania 1946
Creager, Joe C(lyde), Drawer 1267-L.A. Cann Dr., Ponca City, Oklahoma 1948
Cringan, A. T., 22 Collingwood, Guelph, Ontario, Canada 1948
Crockett, David B., 3933 Kirkland Ct., Route No. 3, Pontiac, Michigan ... 1955
Crompton, David H(astings), 74 William St., Worcester, Massachusetts .. 1934
Crone, Miss Anne B., 74 Village Hill Rd., Belmont 78, Massachusetts 1955
Crouch, James E(nsign), San Diego State College, San Diego 5, California . 1928
Crowell, Prince S(ears) Jr., Department of Zoology, Indiana University, Bloomington, Indiana 1946

Crowell, Mrs. Prince S(ears), Box 535, Woods Hole, Massachusetts 1930
Crowley, Larry D., 1212 Cascade, Boulder, Colorado 1955
Crowninshield, Mrs. Francis, Peach Point, Marblehead, Massachusetts ... 1941
Cruickshank, Allan D(udley), Rockledge, Florida ..... (1933) 1945
Crumpacker, Mrs. D. P., R.R. No. 3, Milan, Missouri 1952
Crumkleton, Tolliver, Box 494, Highlands, North Carolina 1953
Cruttenden, John R., Blackstone Building, Quincy, Illinois 1940
Cumming, Fairman P., Box 330, Nashville 1, Tennessee 1952
Cummings, G(eorge) Clark, Rm. 1018, 61 Broadway, New York 6, New York 1951
Cunningham, James W., 3009 E. 19th Terrace, Kansas City, Missouri 1937
Cunningham, Richard L(ynn), 21 S. 56th St., Belleville, Illinois 1952
Curl, Dr. A(lfred) Laurence, 751 Balra Dr., El Cerrito 8, California 1950
Curry, Haskell B(rooks), Department of Mathematics, The Pennsylvania State University, State College, Pennsylvania 1943
Curtis, David Y., 3 Montclair, Urbana, Illinois 1953
Curtis, Miss Elizabeth L., School of Art, University of Washington, Seattle 5, Washington 1934
Curtis, Vee K(aelin), 2412 Cohasset Rd., Chico, California 1947
Cuthbert, Nicholas L(e Huray), Central Michigan College, Mount Pleasant, Michigan 1951
Cutler, Mrs. Edith M(ae), Possum Hill, Green Village, New Jersey 1951
Cutler, Henry H., 5 Shelley Rd., Wellesley Hills 82, Massachusetts 1954
Dahmer, Horace A., 174 Simeon St., Kitchener, Ontario, Canada 1954
Dallas, Donald E(dward), Jr., 14108 Strathmore Ave., East Cleveland 12, Ohio 1953
Dambach, Charles A(rthur), 7085 Linworth Rd., R.F.D. No. 2, Worthington, Ohio 1938
Dana, Edward F(ox), 57 Exchange St., Portland, Maine 1941
D'Angelo, Angelo, 809 Palisade Ave., Union City, New Jersey 1946
Darby, R(ollo) E(verett), 2103 Walnut, Carmichael, California 1950
Darby, Richard T(horn), Prospect St., Sherborn, Massachusetts 1936
Darden, Mrs. Colgate J., Carr's Hill, Charlottesville, Virginia 1954
Darling, Louis, Saxon Lane, Westport, Connecticut 1954
Darrah, Miss Mary Elizabeth, Box 58, Spencer, New York 1955
Dater, Mrs. John Y., Jr., 259 Grove St., Ramsey, New Jersey 1949
Davenport, Mrs. Allen G(raham), (Mabelle Griffith), 39 Walcott Avenue, Jamestown, Rhode Island 1951
Davey, Dr. Winthrop N., University Hospital, Ann Arbor, Michigan 1946
Davids, Jean Linea (Mrs. C. Harvey), 4118 N. Ashland Ave., Chicago 13, Illinois 1951
Davidson, John B., 123 East 11th St., Santa Ana, California 1954
Davidson, Mrs. William F., 332 Summit Ave., St. Paul 2, Minnesota 1955
Davidson, William M(ark), 1504 Bodell St., Orlando, Florida 1927
Davis, Bertha E(unice), 44 Centre St., Brookline, Massachusetts 1920
Davis, Clifford V(ernon), Department of Zoology and Entomology, Montana State College, Bozeman, Montana 1948
Davis, David E(dward), School of Hygiene and Public Health, Johns Hopkins University, Baltimore 5, Maryland ..... (1935) 1941
Davis, Earle A., Jr., College of Osteopathic Physicians and Surgeons, 1721 Griffin Ave., Los Angeles 31, California 1946
Davis, Dr. Edwin G(riffith), 1316 22nd St., South, Arlington 2, Virginia .. 1940

	Davis, Frederick Whitlock, 12004 Colesville Rd., Silver Spring, Maryland	1955
	Davis, Gertrude L. (Mrs. James M.), 203 Collingsworth Drive, Rochester 10, New York	1949
	Davis, Howard Henry, Little Stoke, Patchway, nr. Bristol, England	1946
EM	Davis, Dr. John, Hastings Reservation, Carmel Valley, California. (1939)	1953
EM	Davis, L(ouie) Irby, Box 988, Harlingen, Texas (1935)	1955
	Davis, Malcolm, 904 11th St., S.E., Washington 3, D.C.	1938
	Davis, Paul A(nthony), 829 Grant St., Gary, Indiana	1953
	Davis, Platt (Adams), 1947 Marion St., Albany, Oregon	1951
LEM	Davis, Dr. William B., Department of Wildlife Management, A. and M. College of Texas, College Station, Texas (1938)	1949
	Davis, William E(dwin), Old Acres, R.F.D., Bedford, Massachusetts	1949
	Davis, William Franklin, 423 W. 46th St., Ashtabula, Ohio	1947
	Dawe, Arnold L(ewis), R.R. No. 2, Weston, Ontario, Canada	1948
	Dawn, Walter H(enry), Bulls Island, Awendaw, South Carolina	1947
	Dawson, Richard G(len), 6114 Indiana Ave., Kansas City 30, Missouri	1949
EM	Dawson, Dr. William Ryan, Department of Zoology, University of Michigan, Ann Arbor, Michigan (1947)	1955
	Dean, A. Lawrence, 911 Preston Ave., Blacksburg, Virginia	1939
	Dean, Mrs. Blanche E., 1503 Ridge Rd., Homewood, Birmingham 9, Alabama	1949
	Dean, William B., 282 Lake St., Seekonk, Massachusetts	1946
L	Deane, Mrs. Ruthven, 830 Hibbard Rd., Winnetka, Illinois	1935
	Dear, L(ionel) S(extus), P.O. Box 146, Port Arthur, Ontario, Canada	1928
	Dearborn, John H., Meadow Cove Rd., East Boothbay, Maine	1952
	DeCamps, Ernest Jules, Box 316, Beaufort, South Carolina	1946
	Dechen, Mrs. Lillian O(rvetta), 14 Summer St., Port Dickinson, Binghamton, New York	1949
	Decker, Anton M(ichael), 52 Weybridge St., Middlebury, Vermont	1949
	DeCou, Richard W(illiam), Crosswicks, New Jersey	1949
	DeDobbeleer, Marcel, R.R. #2, Granton, Ontario, Canada	1953
F	Deignan, Herbert G(irton), Division of Birds, U.S. National Museum, Washington 25, D.C. (1923)	1946
	Dejulis, Anne Victoria, 61 Berkeley Ave., Belleville 9, New Jersey	1954
F	Delacour, Jean, Los Angeles County Museum, Exposition Park, Los Angeles 7, California (1920)	1946
	De La Vega, Mario, Jr., c/o Sucs. de Alonso y Cia., S.A., Apartado No. 337, Havana, Cuba	1949
	DeLime, John L., Presquile National Wildlife Refuge, Route 2, Chester, Virginia	1952
	DeLury, Dr. Ralph E(merson), 330 Fairmont Ave., Manilla, Ontario, Canada	1920
	Denham, Reginald, 100 Central Park South, New York, New York	1947
	Denker, Charles Reed, c/o DuPont, S.A. de C.V., Apartado 1799, Mexico 1, D.F., Mexico	1944
	Denney, Dr. John DeWitt, 30 S. 2nd St., Columbia, Pennsylvania	1951
	Dennis, John V(alue), Rt. No. 1, Box 376, Leesburg, Virginia	1948
EM	Denton, J(ames) Fred, 1510 Pendleton Rd., Augusta, Georgia (1935)	1950
HL	Derby, Dr. Richard, Oyster Bay, Long Island, New York	1898
LF	De Schauensee, Rodolphe M(eyer), Devon, Pennsylvania (1925)	1942
L	Desmond, Thomas C(harles), Box 670, Newburgh, New York	1929
	Dettmann, Warren, Milwaukee Public Museum, Milwaukee, Wisconsin	1936
	Deuel, H(arold) F(rancis), 110 Hill, Arcata, California	1950

Deusing, Murl, 5325 W. Van Beck Ave., Milwaukee 14, Wisconsin 1935
DeVane, Claude L., Parks and Playgrounds Department, Courthouse, Tampa, Florida 1954
Devaney, Bernard C(harles), 212 Nevin St., Lancaster, Pennsylvania 1948
De Vel, Dr. Leon, 739 Plymouth Blvd., S.E., Grand Rapids 6, Michigan .. 1948
Devitt, Otto Edmund, Richmond Hill, Ontario, Canada 1933
Devlin, Joseph Mark, 218 South 43rd St., Philadelphia 4, Pennsylvania 1955
De Vos, Dr. Anton, Department of Entomology and Zoology, Ontario Agricultural College, Guelph, Ontario, Canada 1954
De Weese, John Rutledge, P.O. Box 508, Key West, Florida 1953
Dexter, Dr. Ralph W(arren), Kent State University, Kent, Ohio 1952
Dick, Mrs. Alfred S., 32 Hunter Ave., Babylon, New York 1954
Dickens, Miss Elizabeth, Dickens Point, Block Island, Rhode Island 1921
Dickenson, Mrs. Leila B(rundage), 19 Burling Ave., White Plains, New York 1952
Dickerman, Robert W(illiam), Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota 1949
Dickerson, Stanley, 77 Main St., South River, New Jersey 1954
Dickey, Mrs. Florence V.V., Kenton Cottage, Alleghany, Sierra County, California 1948
Dickie, Mrs. Roy N. (Eva S.), 3840 Loquat Ave., Miami 33, Florida 1952
Dickinson, Dr. J(oshua) C(lifton), Jr., Department of Biology, University of Florida, Gainesville, Florida ..... (1937) 1952
Diedrich, John Lester, 3125 West Pierce St., Milwaukee 15, Wisconsin 1948
Dietz, Viola V(eronica), 60 N. Tremont St., York, Pennsylvania 1949
Dignam, John Hugh, 4 Basswood Rd., Willowdale, Ontario, Canada 1953
Dilger, Dr. William C., Department of Biology, Saint Lawrence University, Canton, New York 1951
Dilley, Willard E., Box 219, Grand Canyon, Arizona 1936
Dillman, Mrs. Albert F. (Nora G.), 62 Newton Ave., Sussex, New Jersey . 1951
Dingle, Edward von Siebold, Huger, South Carolina 1920
Dingle, Hugh, 156 Spruce St., Princeton, New Jersey 1953
Disler, Walter C., R.D. No. 1, La Grange, Ohio 1955
Dittemore, Lester Poe, 1207 Bryon Ave., Topeka, Kansas 1952
Dixon, James B(enjamin), R.R. No. 3, Box 1343, Escondido, California 1939
Dixon, James E., R.R. No. 1, Box 429, Escondido, California 1953
Dixon, Dr. Keith L(ee), Department of Wildlife Management, A. and M. College of Texas, College Station, Texas ..... (1943) 1953
Dixon, Ralph E., P.O. Box 981, Del Mar, California 1947
Dodge, Ernest S(tanley), Peabody Museum, Salem, Massachusetts 1936
Doepel, Mrs. Henry W., (Leslie O.), 30 Cooper Lane, Larchmont, New York 1952
Doering, Hubert R(aymond), 715 Westwood Drive, Clayton 5, Missouri 1944
Donnelly, Miss Grace M., 147 Sixth St., Providence 6, Rhode Island 1954
Dornan, John E., Graver's Lane and Flourtown Rd., Chestnut Hill, Philadelphia 18, Pennsylvania 1947
Dorsey, George A., Darlington School, Rome, Georgia 1954
Douglass, Donald W(ickware), Game Division, Department of Conservation, Lansing 26, Michigan 1943
Dowling, P(aul) Bruce, August A. Busch Wildlife Area, Weldon Springs, Missouri 1950
Down, E. H., 28 Lynton Mead, Totteridge, London, N. 20, England 1952
Downing, Paul E., 2595 Waukegan Avenue, Highland Park, Illinois 1954

Downs, Mrs. James R., South Londonderry, Vermont 1954
Dressel, Evan C(harles), Western Reserve Rd., R.R. No. 1, Poland, Ohio 1949
Dresser, Mrs. James D., Jr., 9620 Von Thaden, R.R. No. 4, Wichita, Kansas 1950
Drinkwater, Howard (Frank), Old Road, Whitehouse, New Jersey 1950
Driscoll, Dorothy H., c/o G. C. Whittleridge, The British Embassy, Bangkok, Thailand 1951
Drovedahl, Mrs. Edward (Louise M.), 11365 Coyle Ave., Detroit 27, Michigan 1953
L Drury, Dr. William Holland, Jr., Biological Laboratories, 16 Divinity Ave., Cambridge 38, Massachusetts 1935
EM DuBois, Alexander Dawes, Christmas Lake Road, R.R. No. 5, Excelsior, Minnesota ..... (1905) 1950
Dudley, John Murchie, 20 Germain St., Calais, Maine 1931
Duff, C(arroll) V(ictor), 1922 Tamarind Ave., Hollywood 28, California ... 1953
Duffield, Mrs. J. W. (Marjorie O.), 1472 Eskridge Way, Olympia, Washington 1952
Duffy, John J(oseph), Jr., 7219 Richwood, Little Rock, Arkansas 1952
Dumback, Edward A., Route 1, Box 106, Independence, Wisconsin 1954
EM DuMont, Philip A(tkinson), 4114 Fessenden St., N.W., Washington 16, D. C. ..... (1927) 1941
Dunbar, Mrs. Henry F., R.F.D. No. 3, Box 194, Kingston, New York 1955
Duncan, Stewart, 80 Toxteth St., Brookline 46, Massachusetts 1954
Dundas, Lester Harvey, Rice Lake Wildlife Refuge, McGregor, Minnesota . 1941
Dunham, Mrs. Caroline A(llen), 450 Beverly Rd., Ridgewood, New Jersey . 1933
Dunlap, Dr. V(ining) C(ampbell), Bowdoinham, Maine 1950
Dunning, John S(tewart), 150 Notch Rd., Granby, Connecticut 1950
Dunning, Orville M., 22 Longridge Rd., Plandome, New York 1952
EM Duvall, Allen J(oseph), U. S. National Museum, Washington 25, D.C. (1935) 1948
Dyer, William, 402 John St., Union City, Michigan 1946
Dyke, Samuel H(ull), R.D. #6, Lancaster, Pennsylvania 1949
Earle, Mrs. Arthur H., Bernardsville, New Jersey 1931
Earle, Sylvia Alice, 735 Wilkie St., Dunedin, Florida 1955
Eastman, Francis B(uck), P.O. Box 96, Mandeville, Louisiana 1909
Eastman, Whitney (Haskins), 4450 West Lake Harriet Blvd., Minneapolis 10, Minnesota 1949
Eaton, Richard J(efferson), Bedford Rd., Lincoln, Massachusetts 1930
Eaton, Stephen W(oodman), Department of Biological Sciences, St. Bonaventure College, St. Bonaventure, New York 1942
Ebert, Mrs. Ernest C. (Ruth), 55 So. 6th St., Apt. 312, San Jose, California 1946
Eckelberry, Don (Richard), 4 Foster Lane, Babylon, Long Island, New York 1942
Eddy, Garrett, 4515 Ruffner St., Seattle 99, Washington 1939
Edeburn, Ralph M(ilton), Marshall College, Huntington 1, West Virginia .. 1947
Edey, Maitland A(rmstrong), Wolver Hollow Rd., Brookville, Long Island, New York 1948
Edge, Mrs. Charles Noel, 767 Lexington Ave., New York, New York 1938
Edwards, Alice N(ettleton) (Mrs. O.M.), Grassy Lane Farm, Cazenovia, New York 1949
EM Edwards, Dr. Ernest P(reston), Box 611, Amherst, Virginia ..... (1949) 1954
Edwards, Frank, "Ballabag", The Point, Port Saint Mary, Isle of Man, England 1949

Edwards, Dr. Kenneth F(rederick), 169 Hillendale Ave., Bath Rd., P.O., Kingston, Ontario, Canada 1952
Egerton, Frank N(icholas) III, 411 N. Gregson St., Durham, North Carolina 1952
Einhorn, Benjamin, 7 Parker Ave., West Deal, New Jersey 1946
Eiseman, Ralph Milton, 7928 South Colfax, Chicago 17, Illinois 1954
Eisenhart, Ruth C(ecilia), 724 Amsterdam Ave., New York 25, New York . 1949
LEM Eisenmann, Eugene, 300 Park Avenue, New York 22, New York ... (1936) 1951
Ekblaw, George E(lbert), 511 W. Main St., Urbana, Illinois 1946
Ekdahl, Conrad H(oward), Box 1246, Daytona Beach, Florida 1948
Eklund, Dr. Carl M(ilton), Rocky Mountain Laboratory, Hamilton, Montana 1950
L Eldredge, Everett, Chatham, Cape Cod, Massachusetts 1928
Eliot, Samuel A(tkins), Jr., 31 Dryads Green, Northampton, Massachusetts 1936
Eliot, Theodore L(yman), 401 Golden Gate Ave., Belvedere, California 1940
Elitharp, Miss Marie, 415 Sherman St., Watertown, New York 1954
Elkins, Kimball C(onro), 3-1/2 Madison St., Cambridge 38, Massachusetts 1940
Ellarson, Robert S(cott), 424 University Farm Place, Madison 6, Wisconsin 1952
Ellington, Carl William, 1206 W. Levee St., Brownsville, Texas 1955
Elliott, Charles Fremont, 107 Clinton Place, Hackensack, New Jersey 1936
Elliott, John Jackson, 3994 Park Avenue, Seaford, Long Island, New York .. 1940
Ely, Charles (Adelbert), R.D. No. 2, Wellsboro, Pennsylvania 1948
Ely, Dr. DeForest, 180 Sullican St., New York, New York 1954
Emerson, David Lowell, 155 Burt St., Taunton, Massachusetts 1940
Emerson, Guy, 16 E. 11th St., New York 3, New York 1947
Emerson, Miss Mary Louise, 587 Ashland Ave., Buffalo 22, New York 1949
Emerson, Stephen, c/o Wortis, 145 E. 74th St., New York 21, New York . 1950
Emerson, William S., 273 Parkland Ave., Glendale 22, Missouri 1954
Emery, F(rank) H(ardie), 29 Old Mill Terrace, Toronto, Ontario, Canada . 1928
Emery, Mrs. Ruth P., 225 Belmont St., Wollaston 70, Massachusetts 1954
EM Emilio, S(hepard) Gilbert, Gilford, New Hampshire ..... (1922) 1938
F Emlen, Dr. John T(hompson), Jr., Department of Zoology, University of Wisconsin, Madison 6, Wisconsin ..... (1925) 1949
Engel, G(eorge) Curtis, 460 Spring Ave., Ridgewood, New Jersey 1951
English, Almon Owen, 2803 Rosalind Ave., S.W., Roanoke 14, Virginia ... 1928
English, Dr. Pennoyer Francis, Agric. Educ. Building, Penn State University, University Park, Pennsylvania 1938
Ennis, Dr. J(ames) Harold, Cornell College, Mount Vernon, Iowa 1941
Enssler, Harry Thomas, 411 Waverly Rd., Wyncote, Pennsylvania 1946
Ephraim, William A(bbe), 1630 Grand Ave., Bronx, New York 53, New York 1949
Erickson, Dr. Arnold Burton, 1005-06 Commerce Bldg., Saint Paul 1, Minnesota 1936
Erickson, Dr. John G(erhard), 2515 Thomas Ave., Minneapolis 5, Minnesota 1952
EM Erickson, Dr. Mary Marilla, University of California, Santa Barbara College, Goleta, California ..... (1947) 1950
Erickson, Ray C(harles), Branch of Wildlife Refuges, Fish and Wildlife Service, USDI, Washington 25, D.C. 1946
F Errington, Dr. Paul L(ester), Insectary, Iowa State College, Ames, Iowa ..... (1932) 1952

Eschelman, Dr. Karl F(erdinand), 8 North Drive, Buffalo 16, New York ... 1949
Esten, Miss (Emilia) Virginia, 4340 North Illinois St., Indianapolis 8, Indiana ... 1955
Evans, J(ohn) Harwood, 517 Jackson Drive, Oshkosh, Wisconsin ... 1948
Evans, Monica Ann, Kalamazoo College, Kalamazoo, Michigan ... 1955
Evans, Mrs. Orry R., 403 Marshall St., Syracuse 10, New York ... 1955
Evenden, Dr. Fred G(eorge), Jr., 1336 Fitch Way, Sacramento 21, California ... 1949
Everett, Miss Constance A(ntoinette), 206 9th St., N.E., Waseca, Minnesota ... 1948
Eyer, Lester E(merv), 515 College St., Alma, Michigan ... 1948
Eynon, Alfred Ernest, 424 University Farm Place, Madison 5, Wisconsin .. 1934
Eyre, John Alfred, 460 Gladstone Ave., Toronto 4, Ontario, Canada ... 1946
Eyster, Dr. Marshall B(lackwell), Department of Biology, Box 545, Southwestern Louisiana Institute, Lafayette, Louisiana ... 1949
Eyster, Philip L., 1023 West King St., York, Pennsylvania ... 1955
Fales, John H(ouse), 1917 Elkhart St., Silver Spring, Maryland ... 1939
Fargo, William Gilbert, 506 Union St., Jackson, Michigan ... 1923
EM Farner, Dr. Donald S(ankey), Department of Zoology, The State College of Washington, Pullman, Washington ... (1941) 1946
Farrar, Merritt C(alvin), 942 Bonita Drive, Winter Park, Florida ... 1946
Farrel, Franklin, 3rd, Northrup Rd., Woodbridge, Connecticut ... 1950
Farrington, S(elwyn) Kip, Jr., Main St., East Hampton, Long Island, New York ... 1949
Fasnacht, Carl L., 328 E. Ross St., Lancaster, Pennsylvania ... 1951
Fautin, Dr. Reed Wingate, Department of Zoology and Physiology, University of Wyoming, Laramie, Wyoming ... 1938
Fauvel, Bertram A., 263 McLeod St., Ottawa, Ontario, Canada ... 1948
Faver, Mrs. William H(oward), Eastover, South Carolina ... 1951
Feely, Ranger J(ames) M(ichael), P.O. Box 25, Mtubatuba, Zululand, South Africa ... 1955
Fegel, Arthur C., Box 840, R.F.D. No. 1, Rahway, New Jersey ... 1943
Fehon, Jack H(arold), Department of Zoology, Florida State University, Tallahassee, Florida ... 1951
Feighner, Miss Lena Veta, 298-I S. Tremont St., Kansas City, Kansas 1934
Feinberg, Ezra J(ohn), 41 W. 72nd St., New York 23, New York ... 1951
Feingold, Miss Rose, 4206 St. Charles Ave., New Orleans 15, Louisiana .. 1952
Feldman, Albert Edward, 101 A Fairmont Ave., Kingston, New York ... 1952
Fennell, Chester M(artin), 19239 Coffinbury Blvd., Fairview Park 26, Ohio. 1948
Ferdinand, Dr. (Peter) L(orenz), Scr. Kjeldsgade 12, Copenhagen, Denmark ... 1949
Ferguson, David Sowers, Box 53, R.R., Phillipsburg, Pennsylvania ... 1937
Ferguson, William Henry, 5907 Mason St., Omaha, Nebraska ... 1946
Fernandez, Dr. Ramona, Museo Poey, Catedra "U", Escuela de Ciencias, University de la Habana, Habana, Cuba ... 1950
Ferris, Dr. Deam H., 227 N. Silver St., Lamoni, Iowa ... 1955
Fevold, Harry Richard, Montana State University, Missoula, Montana ... 1955
Ficken, Mrs. Robert W., 41 Shaw Ave., Silver Spring, Maryland ... 1955
Fickett, Stephen Burrows, Jr., P.O. Box 343, Branford, Florida ... 1948
Field, Marshall (Howard), R.R. No. 2, St. Thomas, Ontario, Canada ... 1948
Filer, Ervin E., Little Sister Farms, St. David, Illinois ... 1950
Fillebrown, Thomas Scott, Box 27, Woodstock, Vermont ... 1947

Findley, James Smith, Department of Zoology, University of South Dakota, Vermillion, South Dakota 1948
Fink, Louis C., 227 Woodlawn Ave., Decatur, Georgia 1954
Finley, Dr. John C., Meaford, Ontario, Canada 1953
Fischer, Richard B., Department of Rural Education, Cornell University, Ithaca, New York 1947
Fish, Dr. William R(alph), 302 B. Entwistle St., China Lake, California ... 1951
F Fisher, Dr. Harvey Irvin, Department of Zoology, Southern Illinois University, Carbondale, Illinois ..... (1944) 1950
Fisher, Walter Taylor, 949 Fisher Lane, Winnetka, Illinois 1932
Fisler, George Frederick, 810 F. Birch Rd., East Lansing, Michigan 1955
Fitch, Charles M., 1120 Cove Rd., Mamaroneck, New York 1954
EM Fitch, Dr. Henry Sheldon, Natural History Reservation, University of Kansas, R.R. No. 3, Lawrence, Kansas ..... (1946) 1953
Fitzgerald, Dr. James L(ynn), 130 N. 14th St., Allentown, Pennsylvania ... 1952
Flach, Major B(engt) (Eriksson), Flygvapnet (Royal Swedish Air Force) Stockholm 80, Sweden 1951
Fleming, Robert Leland, 24 E. Columbia, Battle Creek, Michigan 1955
Fleming, Roger, Box 122, Woodsboro, Texas 1953
Fleming, Mrs. Thomas, 1541 Lombardy Rd., Pasadena, California 1935
Flinton, Laurel, Jr., 1288 Lloyd George Ave., Crawford Park, Verdun, Quebec, Canada 1950
Flood, Mrs. Aubrey C., 455 Linden Rd., Birmingham, Michigan 1933
Flowers, Richard H., Jr., Box 735, Greenwood, Mississippi 1953
Fluck, Dr. Paul Havens, 73 N. Union St., Lambertville, New Jersey 1948
Foley, Edward J(ames), 5349 N. Bay Ridge Ave., Milwaukee 17, Wisconsin 1947
Follett, Wilbur Irving, 3501 Broadway, Oakland 11, California 1946
Fontenot, L. Austin, Jr., Ringrose Plantation, Opelousas, Louisiana 1953
L Forbes, Howard M., 87 Church St., Weston, Massachusetts 1953
Forbus, Mrs. Ina B., c/o Watts Hospital, Durham, North Carolina 1954
Ford, Thomas Robert, 223 Spring St., Wooster, Ohio 1955
Ford, Winfred N(athan), Stamford, New York 1949
Fordham, Stephen C(rane), Jr., Delmar Game Farm, Delmar, New York .. 1946
Foree, Dr. Lynn, 379 30th St., Oakland 11, California 1952
L Foster, Francis A(pthorp), Box 31-A, R.R., Vineyard Haven, Massachusetts 1918
Foster, Prof. G(eorge) W(illiam), 1814 Kendall Ave., Madison 5, Wisconsin 1954
L Foster, John Hawley, Wayne, Pennsylvania 1927
Foster, Thomas (Henry), West Rd., Bennington, Vermont 1948
HL Fowler, Henry Weed, Academy of Natural Sciences, 19th St. and Parkway, Philadelphia, Pennsylvania 1898
Fox, Adrian C(aspar), Box 592, Bismarck, North Dakota 1935
Fox, Jennie Ethel, Palisades, Rockland County, New York 1925
Fox, Robert P., 311 Beale St., Wollaston 70, Massachusetts 1951
Fox, Dr. Wade, Jr., Department of Anatomy, Louisiana State University, School of Medicine, New Orleans, Louisiana 1947
Franklin, Mrs. Roberta S., Rob-ben Point, Mountain Lakes, New Jersey .. 1953
Franzen, A(lbert) J(ohn), Chicago Natural History Museum, Chicago 5, Illinois 1934
Frazier, Frank P(earsall), 424 Highland Ave., Upper Montclair, New Jersey 1951

Fredrickson, Richard William, 6D, Sunnyside, University of Kansas, Lawrence, Kansas 1947
Free, George J(amison), 626 Sunset Rd., State College, Pennsylvania 1935
Freeman, Frank Jerome, 2827 Montclaire Dr., N.E., Albuquerque, New Mexico 1947
French, Mrs. Anna Morton, 19 Olyphant Pl., Morristown, New Jersey 1946
French, Dr. J. Douglas, 732 Golden West Ave., Arcadia, California 1946
L French, Mena Vestal (Mrs. George Edward), Box 171, Wayland, Massachusetts 1923
French, Norman Roger, 627 Tendoy Dr., Idaho Falls, Idaho 1953
L Frey, Mrs. Edith Krieger, 814 3rd St., Jackson, Michigan 1923
Freyburger, Dr. Walter Alfred, Jr., 934 Grant St., Kalamazoo, Michigan . 1943
Frieders, Rev. Fabian, St. Meinrad's Abbey, St. Meinrad, Indiana 1950
Friedlander, Norman, 112 W. 44th St., New York, New York 1948
Friedman, Ralph, 14 E. 75th St., New York, New York 1921
P Friedmann, Dr. Herbert, Division of Birds, U.S. National Museum, Washington 25, D.C. ..... (1921) 1929
Fries, Waldemar H., 220 Valley Road, Merion Station, Pennsylvania 1955
Frister, Carl P(hillip), 2956 A.N. 38th St., Milwaukee 10, Wisconsin 1950
Frith, Rowley, 65 Acacia Ave., Ottawa, Ontario, Canada 1947
Fry, Varian, 321 West 78th St., New York 24, New York 1946
Frye, Ozro Earle, Jr., Game and Fresh Water Fish Commission, Tallahassee, Florida 1947
Fuhrmann, Dr. John B(arclay), 5 Main St., Flemington, New Jersey 1950
Fuller, William A(lbert) (Lennox), Fort Smith, Northwest Territories, Canada 1950
Fulton, Chandler Montgomery, Box 621, Brown University, Providence 12, Rhode Island 1955
Furniss, Owen Cecil, Box 756, Alberni, British Columbia, Canada 1931
F Gabrielson, Ira N(oel), R.R. No. 1, P.O. Box 349, Oakton, Virginia ..... (1912) 1938
Gaelick, Norman F., 2019 Ramsay St., Calgary, Alberta, Canada 1953
L Gage, Kathleen R. (Mrs. Charles E.), 401 Great Falls St., Falls Church, Virginia 1943
Gaillard, Stephen Lee, 9 Lee Place, Bronxville, New York 1941
Gaines, Arthur, 1 Wall St., New York 5, New York 1952
Gainey, Louis Franklin, Box 299, Jupiter, Florida 1950
Galley, John E(dmond), 1610 W. Holloway Ave., Midland, Texas 1949
Galloway, Leo A(idis), Fullerton, Nebraska 1951
Gallup, Fred(erick) N(orman), 142 W. 6th Ave., Escondido, California ... 1948
Galt, William L., 436 Walnut Ave., Aldan, Clifton Heights, Pennsylvania . 1955
Gambrill, Mrs. Richard V.N. (Edith B.), Vernon Manor, Peapack, New Jersey 1951
Gamero, Antonio, 1837 N. Alexandria Ave., Hollywood 27, California 1953
Gammell, Ann M. (Mrs. Robert T.), Kenmare, North Dakota 1952
Gammell, Dr. Robert T., Kenmare, North Dakota 1942
EM Ganier, Albert F., 2112 Woodlawn Dr., Nashville, Tennessee .... (1917) 1934
Gantz, R(obert) J. M., R.D. No. 2, Doylestown, Bucks County, Pennsylvania 1949
HL Gardiner, Charles Barnes, 133 W. Main St., Norwalk, Ohio 1903
Gardner, Merriel M(aslin), 9531 E. Stanhope Rd., Kensington, Maryland . 1943
Garlick, Gordon Mark, R.R. No. 1, Box 408, Lake Orion, Michigan 1953
Garrett, (Mary) Lois, 1709 Chestnut St., Kenova, West Virginia 1949

Garrison, David L(loyd), Old Lexington Rd., Lincoln, Massachusetts 1949
Garrison, Robert C(harles), Box 105, Bonita Springs, Florida 1950
Garrity, Devin A(dair), 682 Forest Ave., Rye, New York 1947
Garvan, Mrs. Francis P., 740 Park Ave., New York 21, New York 1948
Gary, W(ilbur) Y(ocum), P.O. Box 1791, Jacksonville 1, Florida 1950
Gashwiler, Jay S., U. S. Fish and Wildlife Service, Snell Hall, Oregon State College, Corvallis, Oregon 1939
Gasparec, Samuel, Box 88, Homer, Alaska 1953
Gates, Doris, Nebraska State Teachers College, Chadron, Nebraska 1952
Gates, Frank Ward R(isdon), 156 Garfield Rd., West Hartford 7, Connecticut 1928
L Gauntlett, Frederic John, 5802 Kirkside Dr., Chevy Chase 15, Maryland .. 1925
Gay, Mrs. Leslie N., Hollins Ave., nr. Lake Ave., Roland Park 10, Baltimore County, Maryland 1954
Geale, B(everley) B., 109 Glenview Ave., Toronto, Ontario, Canada 1952
Geis, Aelred D(ean), Department of Fisheries and Wildlife, Michigan State College, East Lansing, Michigan 1952
Geiselbrecht, Mrs. A. H., Box 71, Beeville, Texas 1955
Gelatis, Mrs. Lee H. (Lillian R.), 234 S. Maple Ave., Apt. G-1, Oak Park, Illinois 1952
Genelly, Richard E., Department of Zoology, University of California, Davis, California 1952
Gensch, Robert H(enry), 105 Clark Ave., Billings, Montana 1938
George, Dr. John L(othar), Division of Conservation, Vassar College, Poughkeepsie, New York 1950
Gerstell, Richard, 355 N. West End Ave., Lancaster, Pennsylvania 1939
Ghiselin, Jon B., 728 Elizabeth St., Salt Lake City 2, Utah 1954
Gibbs, Harold N., A-71 Sowams Rd., Barrington, Rhode Island 1939
Gibbs, Robert Henry, Jr., Department of Biology, State Teachers College, Plattsburg, New York 1947
Gibson, Robert H(oward), R.R. No. 2, Box 336, St. Helena, California ... 1948
Gibson, William Giffin, 449 Maple Ave., Pittsburgh 18, Pennsylvania 1955
Gier, Dr. Herschel T(homas), Department of Zoology, Kansas State College, Manhattan, Kansas 1937
Giesler, J(ohn) Calvin, Box 218, Hines, Oregon 1950
Gifford, Dr. Harold, 3636 Burt St., Omaha 3, Nebraska 1946
Gift, Robert F(ranklin), 935 Washington Ave., Lewisburg, Pennsylvania ... 1950
Gilbert, Dr. Perry W(ebster), Zoology Department, Stimson Hall, Cornell University, Ithaca, New York 1939
Gilchrist, Kennedy Wenger, 2711 Colfax Ave., Evanston, Illinois 1955
Giles, Lester A(lsbra), Jr., American Humane Education Society, 180 Longwood Ave., Boston 15, Massachusetts 1953
Giles, Norman H(enry), Jr., Osborn Botanical Laboratory, Yale University, New Haven, Connecticut 1930
Giles, William G., 22 Humewood Gardens, Toronto 10, Ontario, Canada .. 1954
Gillen, Harold W., c/o Gillen and Company, 120 Broadway, New York 5, New York 1950
Gill, Geoffrey, 24 Overlook Drive, Huntington, Long Island, New York 1940
Gillespie, Mrs. Harold S(halor) (Marjorie K.), 655 Church St., Bound Brook, New Jersey 1951
EM Gilliard, E(rnest) Thomas, American Museum of Natural History, 79th St. and Central Park West, New York 24, New York ..... (1938) 1950

Ginés, Hno., Sociedad de Ciencias Nat. La Salle, Apartado 681, Caracas, Venezuela 1955
Glasgow, Charles A(lfred), 2421 First Ave., Edgely, Bristol, Pennsylvania . 1952
Glasgow, Leslie L., Louisiana State University, School of Forestry, Baton Rouge, Louisiana 1952
Glenn, Robert W(ycoff), 509 Orchard Ave., Avalon, Pittsburgh 2, Pennsylvania 1937
Glenny, Fred H., 1148 Linden Ave., Akron 10, Ohio 1947
Glick, Bruce, Box 185, State College, Mississippi 1948
Glore, W(alter) S(cott), Jr., Danville, Kentucky 1952
Glover, Dr. Fred A., 2211 Holmes Run Dr., Falls Church, Virginia 1945
Gloyd, Dr. Howard K(ay), Chicago Academy of Sciences, 2001 N. Clark St., Chicago 14, Illinois 1939
Gluck, S. Norris, 305 Beauregard St., Charleston, West Virginia 1955
Glynn, Gregory C., 65 Partridge St., Albany 6, New York 1955
F Godfrey, W(illiam) Earl, National Museum of Canada, Ottawa, Ontario, Canada ..... (1942) 1949
Goebel, Herman, 78-52 80th St., Brooklyn 27, New York 1947
Goelet, Robert G., 546 Fifth Ave., New York 36, New York 1952
Goelitz, Walter A(dolph), P.O. Box 58, Milford, Pennsylvania 1916
Goethe, C. M., Anglo-National Bank Bldg., 7th and J Sts., Sacramento 14, California 1947
Goetz, Christian J(ohn), 3503 Middleton Ave., Cincinnati 20, Ohio 1929
Goff, Milton Reeder, 405 Westchester Ave., Rochester 9, New York 1949
Goldman, Luther Chase, Fish and Wildlife Service, San Benito, Texas 1947
Goldstein, Harry B(aruch), 5939 Addison St., Philadelphia 43, Pennsylvania 1947
EM Good, Dr. Albert I., 723 S. Grandview Ave., Yakima, Washington ..... (1939) 1948
Good, Dr. Ernest Eugene, Department of Zoology and Entomology, Ohio State University, Columbus 10, Ohio 1954
Gooden, Sam(uel) (Knapp), 1222 Hunter St., Conway, Arkansas 1951
Goodman, Jeanne Moore, Department of Biology, University of Redlands, Redlands, California 1947
Goodpasture, Katherine Anderson, (Mrs. Ernest W.), 9716 Elrod Road, Kensington, Maryland 1950
Goodridge, Edwin T., Province Line Rd., Princeton, New Jersey 1946
L Goodwill, E. V., Hydrographic Service, Department of Mines and Technical Surveys, Ottawa, Ontario, Canada 1942
L Goodwin, Clive Edmund, 38 Walsh Ave., Weston, Ontario, Canada 1952
Goodwin, Margaret S., Earnley, 38 Oakbourne Rd., West Chester, Pennsylvania 1942
Goodwin, Robert E., 90 East St., Oneonta, New York 1952
Gordon, David C(harles), P.O. Box 213, Carthage, New York 1951
Gordon, Harry E(dgar), 307 Laburnum Crescent, Rochester 20, New York. 1911
Gordon, Malcolm S(tephen), 1305 53rd St., Brooklyn 19, New York 1952
Gordon, Richard J., 528 Seventy-second St., Kenosha, Wisconsin 1954
Gordon, Seth E(dwin), 926 J St., Sacramento, California 1924
Goslin, Charles R., 726 E. King St., Lancaster, Ohio 1936
Gottsch, Werner H(enry), 8110 Cargill, Houston 15, Texas 1948
Gould, Edwin, 475 Longview Rd., South Orange, New Jersey 1954
Gould, Patrick Jerry, 12137 Redberry, El Monte, California 1954

Gow, John P., 13048 Sherbrooke Ave., Edmonton, Alberta, Canada 1955
Graber, William J(ames), III, 695 Twentieth St., Beaumont, Texas 1951
Grace, Lucile C., (Mrs. C.J.), Hilton's Road, Slingerlands, New York 1944
Graf, Dr. William, Department of Natural Sciences, San Jose State College, San Jose 14, California 1953
Graff, George S., 830 Jefferson St., St. Charles, Missouri 1951
Graham, Hatch, Jr., c/o U. S. Forest Service, Happy Camp, California .. 1950
Graham, Hatch, Sr., 1106 Hall of Records, Los Angeles 12, California ... 1947
Graham, Dr. John Cooper, 80 Hanson Place, Brooklyn 17, New York 1949
Grange, Wallace, Sandhill Game Farm, Inc., Babcock, Wisconsin 1923
Grant, Dr. Adele Lewis, 6019 S. Overhill Dr., Los Angeles 43, California 1947
Grant, Cleveland P(utnam), 245 Davis St., Mineral Point, Wisconsin 1924
Grant, Robert H., 2415 Newkirk Ave., Brooklyn 26, New York 1943
Gray, Gifford G., 2795 E. 16th Ave., Vancouver 12, British Columbia, Canada 1955
Grayce, Robert L., 141 Main St., Rockport, Massachusetts 1947
Greeley, Frederick, Engineering Experiment Station, University of New Hampshire, Durham, New Hampshire 1937
Green, Horace O., 86 Greenwood Ave., Greenwood, Massachusetts 1954
L Green, Morris Miller, 39 Wyoming Ave., Ardmore, Pennsylvania 1921
Green, Walon Charles, 341 S. Roxbury Dr., Beverly Hills, California 1951
Greene, Dr. David G., 88 Ashland Ave., Buffalo 22, New York 1954
EM Greene, Earle Rosenbury, 418 S. Holt Ave., Los Angeles 48, California ..... (1921) 1942
Greene, Philip S., 502 Claremont Ave., Kenmore 23, New York 1955
Greenhalgh, Clifton M., P.O. Box 326, Murray, Utah 1944
HL Greenough, Henry V(oss), Greenhold Farm, Maple St., Carlisle, Massachusetts 1901
Greenwalt, Ernest J(agger), Wichita Mountains Wildlife Refuge, Cache, Oklahoma 1932
Greenwalt, Leon, P.O. Box 274, Goshen, Indiana 1949
F Greenway, James Cowan, Jr., Museum of Comparative Zoology, Cambridge 38, Massachusetts ..... (1930) 1948
Gregg, Peter Alan, Big Sur, California 1954
Gregory, Robert S., R.R. No. 1, Mooresville, Indiana 1947
EM Gregory, Stephen S(trong), Box N, Winnetka, Illinois ..... (1906) 1934
Gregory, Tappan, 105 S. La Salle St., Chicago, Illinois 1931
Gresham, Henry L., 15 Fernwood Park, Rochester 9, New York 1947
Grey, Rev. John Hugh, Jr., Box 445, Williamsburg, Virginia 1952
Griffee, W. E., 510 Yeon Bldg., Portland 4, Oregon 1944
EM Griffin, Dr. Donald R(edfield), Biological Laboratories, Harvard University, Cambridge 38, Massachusetts ..... (1936) 1947
Griffin, William W(elcome), 3232 Pine Ridge Rd., N.E., Atlanta, Georgia . 1946
EM Grimes, Samuel Andrew, 4627 Peachtree Circle E., Jacksonville, Florida ..... (1925) 1951
Grimm, Forrest C(raver), 52 Conway St., Carlisle, Pennsylvania 1951
Grimm, William C., 103 S. Second St., Easley, South Carolina 1943
Grinnell, Hilda Wood (Mrs. Joseph), 3016 Benvenue Ave., Berkeley 5, California 1931
LEM Grinnell, Lawrence I(rving), 710 Triphammer Road, Ithaca, New York ..... (1938) 1952
F Griscom, Ludlow, Museum of Comparative Zoology, Cambridge 38, Massachusetts ..... (1908) 1925

Hall, Willis, 1111 Douglas Ave., Yankton, South Dakota 1948
Halle, Louis J(oseph), Jr., 1115 Hill Top Rd., Charlottesville, Virginia ... 1934
Haller, Mrs. C. J. (Margaret), 83 East Main St., Avon, New York 1955
Haller, Capt. Karl W(illiam), AO-864839 (Box 488) 3083d Avn. Dep. Gp. FAFS, Fairfield, California 1949
Halliday, Hugh M., 35 Don River Blvd., Willowdale, Ontario, Canada 1952
Hallman, R(oy) C(line), P.O. Box 37, St. Andrew Stn., Panama City, Florida 1928
Halloran, Arthur F(ranklin), Wichita Refuge, Cache, Oklahoma 1949
L Hamann, Carl F(erdinand), Maple Lane, Aurora, Ohio 1951
Hamershlag, Robert J(oseph), Hook Rd., Katonah, New York 1951
Hames, Frances T., 1230 von Phister St., Key West, Florida 1954
Hamilton, Charles W., 2639 Fenwood, Houston 5, Texas 1947
Hamilton, G(olden) Dale, 2550 Murray St., Shreveport 51, Louisiana 1949
Hamilton, Mrs. R. E. (Anne P.), 704 Greenwood Dr., Dalton, Georgia 1952
Hamilton, Selby W.G., 1402-1/2 Eighth Street, New Orleans 15, Louisiana 1953
Hamilton, Terrell Hunter, 1926 Swenson Ave., Abilene, Texas 1953
Hamilton, Dr. W(illiam) J(ohn), Jr., Department of Conservation, Cornell University, Ithaca, New York 1924
Hamilton, William J., III, Museum Vertebrate Zoology, University of California, Berkeley 4, California 1951
EM Hamerstrom, Dr. F(rederick) N(athan), Jr., R.F.D., Plainfield, Wisconsin ..... (1939) 1941
Hammond, Merrill C(lyde), Lower Souris Refuge, Upham, North Dakota ... 1937
Hammond, Dr. Roland, 41 Boylston Ave., Providence 6, Rhode Island 1924
Hampe, Irving Edward, 5559 Ashbourne Rd., Baltimore 27, Maryland 1933
Hamrum, Charles Lowell, Department of Biology, Gustavus Adolphus College, St. Peter, Minnesota 1948
Hancock, Douglas, 260 Engle St., Apt. 5B, Englewood, New Jersey 1954
Hancock, James W., Route 1, Madisonville, Kentucky 1954
L Hand, Ralph L(evi), 415 West Central, Missoula, Montana 1929
Handley, Charles Overton, Jr., U. S. National Museum, Washington 25, D.C. 1941
EM Handley, Charles Overton, Sr., 6571 Roosevelt Ave., Charleston, West Virginia ..... (1916) 1948
Handley, John McNeel, 6571 Roosevelt Ave., Charleston, West Virginia ... 1947
Hanlon, Robert Wm., Mankato High School, Mankato, Minnesota 1951
EM Hann, Dr. Harry W., 1127 Church St., Ann Arbor, Michigan ..... (1930) 1942
Hanna, Dr. G. Dallas, California Academy of Sciences, Golden Gate Park, San Francisco 18, California 1930
Hanna, Mrs. Hilery E., 901 W. Cedar, El Dorado, Arkansas 1954
Hanna, Wilson Creal, 712 N. Eight, Colton, California 1919
Hannemann, Mrs. Paul F., 22 Fern St., Bangor, Maine 1947
Hannibal, Capt. August, 3501 Greinwich Blvd., Lake Charles, Louisiana... 1954
Hansen, Charles G., Natural History Bldg., Oregon State College, Corvallis, Oregon 1955
Hansman, Robert H(erbert), 1215 Avenue F., Fort Madison, Iowa 1948
EM Hanson, Harold C(arsten), Illinois Natural History Survey, Resources Bldg., Urbana 11, Illinois ..... (1937) 1952
Hanson, Rossalius C(hrist), 2116 Sisson Dr., LaCrosse, Wisconsin 1950
Hanson, Thomas (Lyman), 810 Valley View Apts., 15th & Elm Sts., Allentown, Pennsylvania 1949

Hanson, Dr. William Roderick, 4925 W. Montecito, Glendale, Arizona 1947
Harbeson, Ben., R.R. No. 4, Paris, Kentucky 1948
L Harding, Magnus S., The Highlands, Route 2, Madison 5, Wisconsin 1954
Harding, Mrs. Margaret R(ose), 526 S. Van Ness Ave., Santa Ana, California 1952
Hardy, Frederick C., 200-1/2 Jasper St., Somerset, Kentucky 1949
Hardy, John William, Museum of Natural History, University of Kansas, Lawrence, Kansas 1953
Hardy, Dr. Ross, Department of Biological Sciences, Long Beach State College, Long Beach 15, California 1938
Harford, Dr. Henry M(inor), 1400 Vermont St., Quincy, Illinois 1939
Hargrave, Lyndon L(ane), Box 505, Benson, Arizona 1950
L Harley, James Bickel, R.R. No. 1, Pottstown, Pennsylvania 1946
Harmon, Raymond R., Sr., P.O. Box 217, Byron, Illinois 1954
HLEM Harper, Dr. Francis, 115 Ridgway St., Mt. Holley, New Jersey ... (1907) 1917
Harrington, Miss Nancy J., 116 Shannon St., Middlebury, Vermont 1954
Harrington, Dr. Paul, 813 Bathurst St., Toronto, Ontario, Canada 1922
Harriot, Samuel C(arman), 200 W. 58th St., New York 1934
LEM Harris, Harry, 532 Neptune, Encinitas, California ..... (1911) 1919
Harris, Lucien, Jr., 61 Clarendon Ave., Avondale Estates, Georgia 1930
Harris, Robert D., Canadian Wildlife Service, Department of Resources and Development, Ottawa, Ontario, Canada 1952
Harris, S. Arthur, 1308 W. Minnehaha Pkwy., Minneapolis, Minnesota 1954
Harris, Dr. Stuart Kimball, R.F.D. 4, Georgetown, Massachusetts 1940
Harris, William Geo(rge) F(owle), 147 Hillside St., Milton 86, Massachusetts 1933
L Harris, William Pickett, Jr., 15410 Windmill Point Drive, Grosse Pointe Parks, Michigan 1925
L Harrison, Ed N(ewton), 1134 Glendon Ave., Los Angeles 27, California 1934
L Harrison, George L(eib), St. Davids, Pennsylvania 1919
Harrison, Hal H., 1102 Highland St., Tarentum, Pennsylvania 1944
Harrower, Dr. D(avid) E(lson), Newton, Connecticut 1933
Hart, W(illiam) Stephen, 62 Forden Crescent, Westmount 6, P.Q., Canada . 1926
Harte, Ken, 45 Lawrence Rd., Scarsdale, New York 1952
Hartman, Frank A(lexander), Hamilton Hall, Ohio State University, Columbus, Ohio 1941
Hartshorne, Charles, 1224 E. 57th St., Chicago 37, Illinois 1951
L Hartshorne, James Mott, Fernow Hall, Cornell University, Ithaca, New York 1946
Harty, Stephen Thomas, 2182-15th St., S.W., Akron 14, Ohio 1955
Harwell, Charles Albert, 2630 Hilgard Ave., Berkeley, California 1943
Hasbrouck, Dr. Edwin M(arble), 4909 14th St., N.W., Washington, D.C. . 1939
Hasbrouck, Henry C(rane), 88 Douglas Rd., Glen Ridge, New Jersey 1920
Hasek, Dr. Vaclav Ondrej, 210 Granby Bldg., Cedar Rapids, Iowa 1955
Hastings, E(dward) Earnshaw, 505 Oakley Rd., Haverford, Pennsylvania .. 1946
Hatch, (Clara) Grenville, 3661 Tantalus Drive, Honolulu 14, Hawaii 1950
Hath, Earl Herbert, 2109 Briar Gate Lane, Kirkwood 22, Missouri 1952
HL Havemeyer, H(enry) O(sborne), Mahwah, New Jersey 1893
Hawbecker, Albert C., Fresno State College, Fresno, California 1947
Hawkins, Mrs. Agnes, Rt. 4, Box 752, Phoenix, Arizona 1954
Hawkins, L(eslie) G., P.O. Box 1663, Los Alamos, New Mexico 1947
Hawksley, Dr. Oscar, Central Missouri State College, Warrensburg, Missouri 1943

Haws, Travis G., 740 N. 3 E., Provo, Utah 1955
Haydock, Edward L(aurence), P.O. Box 267, Luanshya, Northern Rhodesia, Africa 1948
Hayman, Robert G(ene), R.F.D. No. 1, Carey, Ohio 1951
Hayne, Dr. Don W(illiam), Department of Zoology, Michigan State College, East Lansing, Michigan 1950
Haynsworth, W(illiam) F(rancis) B(aker), Box 100, Route 3, Sumter, South Carolina 1950
Hays, Helen, 6 First Ave., Johnstown, New York 1954
Hazard, Norwood C., 2815 Sheridan St., Davenport, Iowa 1954
Healy, Joseph F(rancis), 3520 N. Paulina St., Chicago 13, Illinois 1950
Heaps, Miss Pearl, 1916 Park Ave., Baltimore 17, Maryland 1948
Heard, Miss Bessie, 315 College, McKinney, Texas 1955
Heath, Reginald, 10532 128 St., Edmonton, Alberta, Canada 1950
EM Hebard, Frederick V(anuxem), 1500 Walnut St. Bldg., Philadelphia, Pennsylvania ..... (1930) 1951
Hebditch, G(erald) A(ubrey), 92 Rydes Hill Rd., Guildford, Surrey, England 1949
Heckler, Sydney B., 1207 No. 7th St., St. Louis 6, Missouri 1948
Heckscher, Stevens, 55 Sacramento St., Cambridge 38, Massachusetts ... 1952
Hedges, Harold C(harles), R.R. 2, Quivira Lake, Kansas City, Kansas ... 1946
Hefley, Harold M(artin), Panhandle A. and M. College, Goodwill, Oklahoma 1947
Hegner, Frank Arnold, 727 Broad St., Sewickley, Pennsylvania 1924
Heilborn, (Klaus) Axel, 1020 Creekside Dr., Niagara Falls, New York 1949
Heimerdinger, Miss Mary A., 28 Bayview Terrace, Manhasset, New York 1953
Heiser, Joseph M(athew), Jr., 1724 Kipling St., Houston 6, Texas 1939
Helbert, Dr. Hollen G., 338 Monticello Ave., Harrisonburg, Virginia 1954
Helleiner, Frederick M., 207 Cottingham St., Toronto 7, Ontario, Canada 1947
Helmer, Mrs. John H., 847 Ridge Ave., Evanston, Illinois 1954
Helms, Carl W., 336 W. Evers Ave., Bowling Green, Ohio 1952
Hemp, O. C., 231 Churchville Ave., Staunton, Virginia 1954
Henders, Stanley M., P.O. Box 421, Calgary, Alberta, Canada 1955
Henderson, Mrs. Alexander, 337 Aycrigg Ave., Passaic, New Jersey 1946
Henderson, Archibald Douglas, Dunstable R.R. 1, Belvedere, Alberta, Canada 1949
Henderson, Mrs. William L., Gibson Island, Maryland 1953
Hendricks, G. Bartlett, Berkshire Museum, Pittsfield, Massachusetts 1935
Hendricks, Gene Thompson (Mrs. Philip), 900 S. Robberson Ave., c/o C.E. Thompson, Springfield, Missouri 1947
Hendrickson, Dr. George O(scar), Department of Zoology and Entomology, Science Hall, Iowa State College, Ames, Iowa 1943
Hennessy, Wesley J., Department of Engineering, Columbia University, New York 27, New York 1952
Henney, Mrs. Nella B(raddy), 111 Fifth St., Garden City, New York 1950
Henningson, Mrs. Lillian, 124 Cambridge Way, Piedmont 11, California .. 1953
Henry, Cordia J(ohn), Seney National Wildlife Refuge, Seney, Michigan ... 1934
Hensley, M(arvin) Max, Department of Biology, Gettysburg College, Gettysburg, Pennsylvania 1949
Henwood, Mrs. Ethel M., 806 S. Lincoln, Urbana, Illinois 1947
Herberger, Joseph Thomas, 506 South College, Fort Collins, Colorado ... 1955
Herman, Dr. Carlton M(artin), Patuxent Research Refuge, Laurel, Maryland 1951

	Hermes, Robert C(arlyle), Route 1, Box 406, Epmore Drive, Homestead, Florida	1949
	Herndon, Dr. Lee R., 1533 Burgie Place, Elizabethton, Tennessee	1946
	Herroelen, Paulus Adolphus, Boîte Postale 19, Basankusu, Equateur, Belgian Congo, Africa	1954
EM	Hersey, F(rank) Seymour, Bay Road, Easton, Massachusetts (1911)	1916
	Hershey, Miss Clara L(ouise), 168 Lincoln St., Steelton, Pennsylvania	1937
	Hewitt, Dr. Oliver H(arold), Dept. of Conservation, Fernow Hall, Cornell University, Ithaca, New York	1944
	Heywood, Philip B., 332 Main St., Worcester 8, Massachusetts	1947
L	Hibbert, Mrs. Harold, Bettws-Y-Coed, Yarrow St., Bryn Mawr, Pennsylvania	1926
F	Hickey, Dr. Joseph J(ames), 424 University Farm Pl., Madison 5, Wisconsin (1936)	1954
EM	Hickey, Margaret Brooks (Mrs. Joseph James), 5517 Dorsett Dr., Madison 5, Wisconsin (1933)	1952
	Hickman, Mrs. Herbert Austin, 2 Lexington Ave., Buffalo 22, New York	1947
LF	Hicks, Dr. Lawrence Emerson, 8 Chatham Rd., Columbus 2, Ohio (1929)	1941
L	Hicks, Thomas W(illiam), 1225 Benton Ave., Springfield, Missouri	1948
	Highley, Seward T(rainer), 43 Powder House Rd., Medford 55, Massachusetts	1953
	Hight, Gordon Lee, Jr., Box 1626, Rome, Georgia	1953
	Higman, H(arry) W(entworth), 12750 39th N.E., Seattle 55, Washington	1938
L	Hildreth, Miss Mary A., Park St., Haverhill, New Hampshire	1947
L	Hill, Julian W(erner), 1106 Greenhill Ave., Wilmington, Delaware	1934
	Hill, Dr. Norman P(eirce), 2308 Highland Ave., Fall River, Massachusetts	1943
	Hill, William P., "Millrace", Peterborough, New Hampshire	1955
	Hill, Dr. W. W., Department of Anthropology, University of New Mexico, Albuquerque, New Mexico	1951
L	Hinchman, Richard M(ay), 75 Fairbanks Rd., Milton 86, Massachusetts	1930
	Hinds, Frank J., Department of Biology, Western State Teachers College, Kalamazoo, Michigan	1935
	Hines, Joseph A(ustin), 30-12 49th St., Long Island City 3, New York	1947
	Hinshaw, Thomas D(oane), 1827 San Juan Ave., Berkeley 7, California	1930
	Hipple, Byron T(homas), Jr., 114 Chestnut St., Albany 10, New York	1949
	Hirshberg, Eliot P(aul), 72 Mamaroneck Rd., Scarsdale, New York	1952
	Hitchcock, Dr. Harold B., Department of Biology, Middlebury College, Middlebury, Vermont	1939
LEM	Hochbaum, Hans Albert, Delta, Manitoba, Canada (1942)	1946
	Hock, Dr. Raymond J., Arctic Health Research Center, U.S. Public Health Service, Box 960, Anchorage, Alaska	1946
	Hodge, Dr. George E(splin), 53 Belvedere Circle, Westmount, Montreal, Canada	1951
	Hodges, Jim (James), 3650 Rockingham Road, Davenport, Iowa	1946
L	Hoffmann, Lukas, Tour du Valat, Par le Sambuc, B.D. R.H., France	1955
	Hoffman, Mrs. Mary, 242 Huron St., Apt. 7, London, Ontario, Canada	1948
	Hoffmeister, Linus C(hristian), 504 W. Ripo, Lemay 23, Missouri	1939
	Hofslund, Dr. Pershing B(ernard), Biology Department, Duluth Branch, University of Minnesota, Duluth, Minnesota	1948
	Hoiberg, Dr. Arnold John, Rte. 3, Box 226, El Dorado, Arkansas	1948
	Holcombe, Alexander H., Jr., 1330 Young's Ford Rd., Gladwyne, Pennsylvania	1949
	Holden, Fenn M(itchell), Box 428, Grayling, Michigan	1952

Holdom, Canon M(artin), Lindsay Cottage, Crescent Beach, British Columbia, Canada 1950
Holgersen, Holger, Stavanger Museum, Stavanger, Norway 1949
Holland, Harold May, Box 615, Galesburg, Illinois 1910
Hollerith, Richard, 815 Cedar St., Apt "C", Riverton, New Jersey 1946
Hollom, Philip A.D., Branksome, Pyrford, Woking, England 1942
Holman, John P(aulison), Fairfield, Connecticut 1922
Holman, Robert C., 121 Chestnut St., Mifflinburg, Pennsylvania 1947
Holmberg, Miss Severena C(aroline), 4827 Woodlawn Blvd., Minneapolis 17, Minnesota 1949
EM Holt, Ernest G(olson), c/o Miss Olivia Holt, 713 Monroe St., Montgomery 5, Alabama ..... (1911) 1925
Holz, Alfred O., 125 E. Kolb Street, Green Bay, Wisconsin 1953
Hood, William Richard, 300 N.W. 19th, Oklahoma City, Oklahoma 1952
Hoover, Dr. Kenneth B(ert), Grantham, Pennsylvania 1953
Hopkins, Milton N(ewton), Jr., 202 W. Roanoke Dr., Fitzgerald, Georgia . 1950
Horn, Frank E., 538 East 21st St., Brooklyn 26, New York 1954
Horsey, R(ichard) E(dgar), 320 Eaglehead Rd., East Rochester, New York. 1919
Hough, Fred, Accord 1, New York 1955
Hough, John N(ewbold), 1515 Mariposa, Boulder, Colorado 1946
L Houston, C(larence) Stuart, Box 150, Sutherland, Saskatchewan, Canada ... 1943
Hovingh, Peter, Jr., Allendale, Michigan 1955
F Howard, Dr. Hildegarde (Mrs. H. Anson Wylde), Los Angeles County Museum, Exposition Park, Los Angeles 7, California ..... (1928) 1946
Howard, Julian A., Aransas National Wildlife Refuge, Austwell, Texas 1954
Howe, Dr. H(enry) Branch, Jr., 420 North Main St., Barbourville, Kentucky 1943
LEM Howell, A(lfred) Brazier, Alna, Maine ..... (1909) 1922
EM Howell, Dr. Joseph C(orwin), Zoology and Entomology Department, University of Tennessee, Knoxville, Tennessee ..... (1928) 1949
Howell, Thelma, Wesleyan College, Macon, Georgia 1947
EM Howell, Dr. Thomas R(aymond), Department of Zoology, University of California, Los Angeles 24, California ..... (1948) 1953
Howes, Paul Griswold, The Bruce Museum, Bruce Park, Greenwich, Connecticut 1951
Howland, John LaFollette, 18 Overlook Rd., Quincy 69, Massachusetts 1955
Howsley, L(ucien) R(eeder), 3029 Glenn Ave., Los Angeles 23, California . 1950
Hoy, Nelson D., 500 Sharon Ave., Sharon Hill, Pennsylvania 1943
L Hoyt, Sarah Foresman (Mrs. J. Southgate Y.), Fernow Hall, Cornell University, Ithaca, New York 1940
Hubbs, Dr. Carl L., Scripps Institution of Oceanography, La Jolla, California 1947
Hubert, Philip A(rthur), Jr., P.O. Box 618, Bellport, Long Island, New York 1949
Hudson, Floyd E., 109 Rehobeth Ave., Rehobeth Beach, Delaware 1955
EM Hudson, Dr. George E(lford), 303 Side St., Pullman, Washington .. (1928) 1948
Huenecke, Howard S., Des Lacs National Wildlife Refuge, Kenmare, North Dakota 1952
EM Huey, Laurence M., Natural History Museum, Balboa Park, San Diego, California ..... (1920) 1932
Huff, N. L., 1219 7th St., S.E., Minneapolis 14, Minnesota 1924
Hughes, Dr. S(helby) B(ond), 521 E. Jefferson St., Clinton, Missouri 1949
Hughes, Stuart W., 156 Orchard St., Newark 2, New Jersey 1955
Hughes, Wallace, 305 Mayo, Tallahassee, Florida 1947

L Hughes, William M., 8755 S.W. Marine Drive, Vancouver 14, British Columbia, Canada 1953
Humphrey, James (Rae), 3010 Lowell Blvd., Denver 11, Colorado 1949
Humphrey, Philip Strong, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1947
HL Hunn, John T(ownsend) S(harpless), 389 Washington Ave., Winchester, Massachusetts 1895
Hunnewell, Miss Louisa, 848 Washington St., Wellesley, Massachusetts .. 1936
Hunt, Dr. Gerald Marshall, 3911 Alicia Dr., San Diego 7, California 1952
Hunt, Miss Helen C(ummings), Washington, Connecticut 1928
Hunt, Lawrence Barrie, 203 South 16th St., Richmond, Indiana 1954
Hunt, Richard Allen, 409-1/2 N. Elm St., Horicon, Wisconsin 1952
Hunter, Isaac R., Route 3, Dowagiac, Michigan 1955
Hunter, John, R.R. No. 2, Saskatoon, Saskatchewan, Canada 1954
Hunter, Raymond H(arrison), Box No. 1, San Antonia, New Mexico 1952
Huntington, Charles E(llsworth), Department of Biology, Bowdoin College, Brunswick, Maine 1949
Hurlbutt, Miss Catherine A., 1910 So. Marion St., Denver 10, Colorado .. 1947
Hurley, John Beatty, 401 S. 17th Ave., Yakima, Washington 1946
Hurrie, David, Apt. 8C, Devonshire Apartments, Brockville, Ontario, Canada 1952
Hutchinson, Arthur E(mlen), 2640 Glendessary Lane, Santa Barbara, California 1940
Hutchinson, Elverta G(raves), 1313 David Rd., Loveland, Ohio 1951
L Huyler, Coulter D(unham), Dewees Island via Charleston, South Carolina .. 1928
Imhof, Thomas A(nthony), 307 38 St., Fairfield, Alabama 1947
Ingle, Mrs. Gertrude (Mussell), Miller Place, Long Island, New York 1950
Ingles, Dr. Lloyd Glenn, Fresno State College, Fresno, California 1947
Ingraham, Edward A(ndrews), 164 Montague St., Brooklyn 1, New York ... 1930
Irving, J(ames) Gordon, 400 Sunset Ave., Haworth, New Jersey 1943
Irving, Mrs. William Gary, Van Houten Fields, West Nyack, New York ... 1947
Isaac, Donald E., 6258 Highland Ave., Richmond 9, California 1954
Ivor, H. Roy, R.R. No. 1, Erindale, Ontario, Canada 1947
Jacisin, Robert J., 1331 Beverly Rd., Port Vue, McKeesport, Pennsylvania . 1955
Jackson, C(icero) F(loyd), University of New Hampshire, Durham, New Hampshire 1936
HL Jackson, Dr. Hartley H(arrard) T(hompson), Room 61, U. S. National Museum, Washington 25, D. C. 1910
Jackson, Morris N., R.R. No. 1, Fanny Bay, British Columbia, Canada ... 1952
Jackson, William Bruce, c/o Dist. Administrator's Office, Trust Terr. of Pacific Islands, Ponape, Caroline Islands 1951
Jacobson, Dr. Malcolm Arthur, 13 W. 36th St., New York 19, New York .. 1947
Jahn, Frances Floed (Mrs. Theodore), 10241 Chrysanthemum Lane, Los Angeles 24, California 1947
James, Frances C., (Mrs. Douglas), P.O. Box 3566, Arsenal, Arkansas .. 1953
James, Frank S., P.O. Box 419, Cutchogue, New York 1954
James, Mrs. Mabel F., R.R. #1, Brownington, Missouri 1953
James, William S., P.O. Box 302, Chatham, Virginia 1953
Janssen, Robert B., Bldg. 35, Apt. G, Benjamin Harrison Village, Indianapolis 16, Indiana 1949
Janvrin, Dr. E(dmund) R(andolph) P(easlee), 38 East 85th St., New York 28, New York 1919

EM Jaques, F(rancis) L(ee), 10 E. Oaks Rd., North Oaks Farm, St. Paul 13, Minnesota ..... (1924) 1934
Jaquith, Barbara E(lizabeth) (Mrs. L. Everett), 84 Poplar Plains Crescent, Toronto, Ontario, Canada 1940
Jeffress, Robert M(iller), 390 Stockton Lane, Richmond 21, Virginia 1949
Jehl, Jozeph R(eiher), Jr., 385 Grove St., Clifton, New Jersey 1952
Jenkins, James H(obart), School of Forestry, University of Georgia, Athens, Georgia 1941
Jenkins, Lloyd (Smith), Davis Hill Rd., Paxton, Massachusetts 1932
L Jenkins, Dr. W(illiam) J(ones), P.O. Box 7, Olanta, South Carolina 1949
Jenks, Randolph, 2146 E. 4th St., Tucson, Arizona 1928
Jenner, William A(lexander), 7908 Kipling Parkway S.E., Washington 28, D.C. 1932
Jennings, William S(elden), 1406 Crestwood Rd., Austin, Texas 1949
Jensen, Finn, Pontiac State Hospital, Pontiac, Michigan 1954
L Jeter, Horace Hearne, 4534 Fairfield Ave., Shreveport 55, Louisiana 1946
F Jewett, Stanley G(ordon), 1404 S.E. Bidwell St., Portland 2, Oregon (1906) 1940
L Johnson, Charles Alfred, c/o Colorado Museum of Natural History, Denver, Colorado 1927
Johnson, Daniel P(aige), Cape Cod Council, Inc., 147 Winter St., Hyannis, Massachusetts 1951
Johnson, H(arold) V(ictor), 927 W. Broadway, Eugene, Oregon 1947
Johnson, Harris E(lmer), R.R. No. 1, Warren, Pennsylvania 1949
Johnson, Mrs. Herbert R(ay), 137 Engle St., Tenafly, New Jersey 1950
Johnson, H(ugh) P(hilip) H(ewitt), Knutsford, Oak End Way, West Byfleet, Surrey, England 1950
Johnson, John C(hristopher), Jr., Department of Zoology, University of Oklahoma, Norman, Oklahoma 1953
Johnson, John O., 112 Seventh St., S.E., Watertown, South Dakota 1952
L Johnson, Dr. Murray L(eathers), 501 N. Tacoma, Tacoma, Washington ... 1935
Johnson, Ned Keith, 624 Lake St., Reno, Nevada 1951
Johnson, Perry F(rank), 670 Bell Ave., Elyria, Ohio 1937
Johnson, Raymond Roy, Rt. 2, Box 269, Glendale, Arizona 1955
EM Johnson, Dr. R(obert) A(nthony), R.D. No. 2, Gosport, Indiana ... (1930) 1946
Johnston, Mrs. Bette J(ane), 137 South Gratiot Ave., Mount Clemens, Michigan 1955
Johnston, David Ware, Department of Biology, Mercer University, Macon, Georgia 1947
Johnston, Irma K., Box 206, Huntington, New York 1949
Johnston, Richard F(ourness), Museum of Vertebrate Zoology, Berkeley 4, California 1950
L Jones, Duvall A(lbert), 8227 Philadelphia Rd., Baltimore 6, Maryland 1952
Jones, Ethel D., 859 Linden Ave., Shreveport, Louisiana 1954
Jones, F(red) M(inson), Box 1864, Williamsburg, Virginia 1931
Jones, Dr. Harold Charles, Berry, Mount Berry, Georgia 1946
Jones, John C(ourts), 5810 Namakagan Rd., Washington 16, D.C. 1930
Jones, Marlin Charles, Box 73, Rupert, Idaho 1953
Jones, S(olomon) Paul, 509 West Ave., North, Waukesha, Wisconsin 1920
L Joost, Dr. Arthur Martin, Jr., Bucksport, Maine 1942
Jopson, Dr. Harry G(orgas) M(ichener), Bridgewater College, Bridgewater, Virginia 1949
Jorae, Irene F., Central Michigan College of Education, Mt. Pleasant, Michigan 1947

Joslin, Charles H(anks), 406 Sidney St., Port Orchard, Washington 1949
Joslyn, Joy E., 1306 Hayes Ave., Racine, Wisconsin 1955
Joyner, J(ohn) W(illiam) E(dwin), 1504 Lindy Ave., Rocky Mount, North Carolina 1947
Jubon, John M(athew), P.O. Box 16, East Millstone, New Jersey 1952
Judd, Robert S., 75 Old Farm Rd., Hamden 14, Connecticut 1948
Jung, Clarence S(chram), 6383 N. Port Washington Rd., Milwaukee 17, Wisconsin 1921
Jurica, Rev. Edmund, St. Procopius College, Lisle, Illinois 1946
Juster, Kenneth W., 140 Riverside Dr., New York 24, New York 1955
Justin, Rev. Brother, M., s.g., Juvenat St. Gabriel, St. Bruno Co., Chambly, Province of Quebec, Canada 1951
Kahl, (Marvin) Philip, Jr., 122 E. 47th St., Indianapolis, Indiana 1952
Kaiman, Bernard D(avid), 205 South Castle St., Knoxville, Tennessee 1950
F Kalmbach, E(dwin) R(ichard), 1601 Mariposa St., Boulder, Colorado ..... (1910) 1927
Kase, John C(harles), 501 Chestnut St., Mifflinburg, Pennsylvania 1949
Kaspar, John L(oren), 392 23rd St., Oshkosh, Wisconsin 1948
Kassoy, Irving, 235 S. 4th St., Columbus, Ohio 1954
Kaufmann, John Henry, 531 Park Ave., Towson 4, Maryland 1955
Keating, Dr. F(rancis) Raymond, Jr., 620 Tenth Ave., S.W., Rochester, Minnesota 1941
Keeler, James E., 3576 Georgetown Dr., Montgomery, Alabama 1952
Keenan, Bennett R., 251 First St., Melrose 76, Massachusetts 1955
Keenan, James T., Ogden, Iowa 1955
Keeton, Luther F., 80 Eastland Dr., Memphis, Tennessee 1945
Keim, Frank T., 580 Ridgemount Crescent, Port Credit, Ontario, Canada . 1952
Keller, Richard T., 717 S. 16th St., St. Joseph 36, Missouri 1947
Kelley, Neil T(homas), 13137 Balfour Rd., Huntington Woods, Michigan ... 1951
Kellogg, Juliet Richardson (Mrs. Waters), 59 Phillips Street, Andover, Massachusetts 1937
EM Kellogg, Dr. (Peter) Paul, 115 Dearborn Place, Ithaca, New York ... (1929) 1939
Kelly, Alfred W(illiam) B(uchanan), 2177 Lincoln Ave., Apt. 12A, Montreal, Quebec, Canada 1951
Kelly, Dr. Joan M(orton), 352 Nautilus St., La Jolla, California 1952
LEM Kelly, Junea W(angeman) (Mrs. George Earle), 1311 Grand St., Alameda, California ..... (1929) 1949
Kelly, Virgil (Franklin) Jr., 212 Highland Ave., Fayetteville, North Carolina 1949
Kemnitzer, Allen E(dward), 969 Five Mile Line Rd., Webster, New York . 1949
Kemper, Dr. Charles A., 733 Maple St., Winnetka, Illinois 1954
Kemsies, Emerson, Department of Zoology, University of Cincinnati, Cincinnati 21, Ohio 1949
Kenaga, Eugene E., 1629 Isabella Rd., Route 5, Midland, Michigan 1949
LF Kendeigh, Dr. S. Charles, Vivarium Bldg., University of Illinois, Champaign, Illinois ..... (1923) 1943
Kendig, Dr. Perry F., 114 College Ave., North, Salem, Virginia 1954
Kennedy, Bruce H., 389 West 10th Ave., Columbus 1, Ohio 1954
Kent, Lawrence C., 1896 Cowden Ave., Memphis 4, Tennessee 1946
Kenyon, G(eorge) Paul, Box 172, 260 Crittenden Blvd., Rochester 20, New York 1952
Kenyon, James A(nthony), 417 Third Ave., Lewiston, Idaho 1946
Kenyon, Karl Walton, 8923 236th St., S.W., Edmonds, Washington 1944

Kerr, Renwick R., 4852 North 33rd Rd., Arlington 7, Virginia 1955
Kersting, Cecil C(arl), Socony-Vacuum of Venezuela, Apartado 246, Caracas, Venezuela 1949
Kesner, Robert T(aylor), 1 River Glen, Hastings-on-Hudson, New York ... 1952
LEM Kessel, Dr. Brina, Department of Biological Science, University of Alaska, College, Alaska ..... (1948) 1954
L Kieran, John 1360 Midland Ave., Bronxville 8, New York 1947
Kikkawa, Jiro, No. 306 Shinmachi, Chiba-shi, Honshu, Japan 1954
Kildow, T(homas) Monroe, Box 910, Tiffin, Ohio 1942
Kilham, Dr. Lawrence, Rocky Mountain Laboratory, U.S. Public Health Service, Hamilton, Montana 1952
Killpack, Merlin L(eo), Union High School, Roosevelt, Utah 1949
Kimball, Miss Mary B(oydston), 809 Main Street, Sisterville, West Virginia 1952
Kincaid, Edgar B(ryan), Jr., 702 Park Pl., Austin, Texas 1953
Kinch, Carol M., 906 N. Grant St., Lexington, Nebraska 1952
King, James R(oger), Department of Zoology, State College of Washington, Pullman, Washington 1952
Kingsbury, Dr. Marguerite, Sunmount, New York 1950
Kinney, Mrs. Warren, P.O. Box 8, New Vernon, New Jersey 1951
Kinsey, Eric Campbell, 155 Bothin Rd., P.O. Box 76, Manor, Marin County, California 1936
Kinsley, C(harles) H(arwood), Rm. 1, Agriculture Bldg., Embarcadero at Mission St., San Francisco 5, California 1949
Kirk, Lester King, 19520 Bretton Dr., Detroit 23, Michigan 1954
L Kirkham, Stanton D(avis), 152 Howell St., Canandaigua, New York 1910
Kissam, Edward Bernard, 631 Seldon St., Detroit 1, Michigan 1954
Kitchen, Herman W., 423 W. 118th St., New York 27, New York 1952
Klabunde, Walter, Creek Rd. Ext., R.F.D. 1, Lewiston, New York 1949
Kleber, Richard T., 37 Eames St., North Reading, Massachusetts 1955
Kleen, Richard L., Box 122, St. Michaels, Maryland 1953
Klepfer, Ward, 169 Morris Ave., Buffalo 14, New York 1940
Kletzly, Robert C., Box 390, Beckley, West Virginia 1955
Klonick, Allan S., 828 Grosvenor Rd., Rochester 18, New York 1938
Kloppenborg, Albert Blaine, 901 E. 7th St., N., Newton, Iowa 1953
Knapp, W(ilfrid) A(rthur), 363 Blythwood Rd., Toronto 12, Ontario, Canada 1950
Knickmeyer, Robert R., 8627 North Ave., St. Louis 21, Missouri 1946
Knight, Howard, Weber College, Ogden, Utah 1949
Knoder, Cecil Eugene, 12-1/2 Palmer St., Athens, Ohio 1952
Knorr, Owen A(lbert), Rt. 1, Box 100, Boulder, Colorado 1949
Knox, Miss Lucy R., 2000 California St., San Francisco 9, California 1954
Knox, Miss Margaret R(ichardson), 4030 Park Ave., Indianapolis 5, Indiana 1941
Knudsen, Mr. Holger, 507 Parkside Dr., Toronto 3, Ontario, Canada 1953
Knudson, James E., 3833 No. 30th St., Arlington 7, Virginia 1955
Kobayashi, Keisuke, No. 2, 1-Chome, Shinohara-Kitamachi, Nada-Ku, Kobe (Rokko), Japan 1951
EM Koford, Dr. Carl B., 537 Smith St., Fort Collins, Colorado ..... (1942) 1953
Kolb, C(harles) Haven, 5915 Meadow Rd., Baltimore 6, Maryland 1937
Korns, Commodore Virgil E., U.S. Navy Ret., 1A E. Irving St., Chevy Chase 15, Maryland 1955
Kortheuer, H(ermann) Francis, R.R. No. 2, Falls Village, Connecticut ... 1950

LEM Kortright, Francis Herbert, 633 Eastern Ave., Toronto, Ontario, Canada ..... (1942) 1945
Kossack, Charles W., 715 S. Division St., Barrington, Illinois 1946
Kozicky, Edward Louis, Wildlife Research Unit, Iowa State College, Ames, Iowa 1947
Kramer, Quintin, 872 Ledger Bldg., Philadelphia 6, Pennsylvania 1946
Kraus, Dr. Douglas L(awrence), Department of Chemistry, University of Rhode Island, Kingston, Rhode Island 1940
Krause, Herbert, 1811 1st Ave., South, Sioux Falls, South Dakota 1955
Krebs, R(obert) W(illiam), 1272 Alfred St., Baton Rouge, Louisiana 1952
Krehbiel, A(dolf) J(acob), 221 Jefferson St., Clayton, New Mexico 1949
Kreule, Albert, Sussex House, 12 Friars Stile Rd., Richmond, Surrey, England 1955
L Krivanek, Mrs. J. O., Department of Zoology, Newcomb College, Tulane University, New Orleans, Louisiana 1952
Krug, Howard H(enry), Chesley, Ontario, Canada 1932
Krumm, Kenneth, Lacreek National Wildlife Refuge, Martin, South Dakota 1938
EM Kubichek, Wesley Frank, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. ..... (1919) 1939
Kuenzler, Edward Julian, Jr., Box 51, 7th Tactical Depot Sqdn, A.P.O. 239, San Francisco, California 1953
Kuhlman, Franklin R., 100 Margaret St., Lake Mills, Wisconsin 1954
Kunkle, Donald (Edward), 29 Edgewood Rd., Bloomfield, New Jersey 1950
Kuschke, Arthur Wyndham, Jr., 522 Kingston Rd., Oreland, Pennsylvania . 1935
Kyllingstad, Henry C(arrel), Arab States Fundamental Education Center, Sirs-el-Layyan, Menoufia, Egypt 1947
La Bastille, Anne, 148 N. Arlington Ave., East Orange, New Jersey 1955
LaBelle, George A., Cocagne, New Brunswick, Canada 1939
Labisky, Ronald F., 1323 4th Ave., S.E., Aberdeen, South Dakota 1955
Lacey, Mrs. Trammel C(alhoun), Drawer 830, Nacogdoches, Texas 1953
Lagerlof, Sven Christian, Tingshuset, Boden, Sweden 1952
Laidlaw, Anne, 32 North Sherbourne St., Toronto, Ontario, Canada 1953
EM Laing, Hamilton Mack, Comox P.O., British Columbia, Canada ... (1917) 1941
EM Lamb, Chester C., Escobedo 69, Irapuato, Guanajuato, Mexico .... (1943) 1954
Lamm, Donald W., American Consulate General, Accra, Gold Coast, Africa 1941
Lampe, M(ontgomery) L(ewis), 21 W. Roseville Rd., Lancaster, Pennsylvania 1949
Lancaster, Douglas A(lan), Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana 1949
Lanceley, W. H., 23 Elmdale Ave., Ottawa 2, Ontario, Canada 1926
Land, Hugh Colman, 3372 8th St. Road, Huntington, West Virginia 1953
Langelier, Mrs. Gus(tave) (Adolphe), 95 de l'Entente Blvd., Quebec, Canada 1940
Langford, Dr. Arthur N., Bishop's University, Lennoxville, Quebec, Canada 1952
Langstroth, James H(eidel), Box 1130, Silver City, New Mexico 1924
Lanning, Robert George, P.O. Box 9, Belleville, Ontario, Canada 1942
Lanyon, Wesley E., Department of Zoology, University of Arizona, Tucson, Arizona 1947
Lapham, Virgil Texas, P.O. Box 233, Denham Springs, Louisiana 1946
Larkin, Harry Hubbard, 189 Van Rensselaer St., Buffalo 10, New York 1949

Larrabee, William M., 255-37 Upland Rd., Great Neck, New York 1955
Larson, Mervin W., 2440 River Dr., Stockton 4, California 1954
LEM Laskey, Amelia R. (Mrs. F.C.), 1521 Graybar Lane, Nashville, Tennessee ..... (1933) 1951
Latham, Roy, Orient, Long Island, New York 1916
Latta, Katharine, 430 W. Moreland Ave., Philadelphia 18, Pennsylvania ... 1949
Laudenslager, May S., 5108 Waukesha Rd., Washington 16, D.C. 1953
Laughlin, Robert M(oody), Drakes Corner Rd., Princeton, New Jersey 1951
Laux, Louis J., Jr., 188 No. Ocean Ave., Freeport, New York 1955
Law, Mr. Cecil E(rnest), 378 Whitby Ave., Ottawa 3, Ontario, Canada ... 1953
Lawrence, Dr. John M., 2203 Easy St., Rt. 1, Pullman, Washington 1952
EM Lawrence, Mrs. Louise de Kiriline, Rutherglen, Ontario, Canada.. (1946) 1954
Lawson, Ralph, 5 Carpenter St., Salem, Massachusetts 1917
Lawson, W. J., Men's Residence, University of Natal, Oribi, Pietermaritzburg, South Africa 1955
Lea, Dr. Robert B(ashford), 1640 Dufossat St., New Orleans 15, Louisiana 1941
L Learing, Geo(rge) Richmond, 168 Beacon St., Boston, Massachusetts 1924
Leavitt, Benjamin B., Department of Biology, University of Florida, Gainesville, Florida 1947
Leaycraft, Mrs. Edgar C. (Helen B.), Hills Point Rd., Westport, Connecticut 1950
Lee, George R(eynolds), 514 Valencia Dr. N.E., Albuquerque, New Mexico 1949
Leedy, Dr. Daniel L(oney), Fish and Wildlife Service, Department of the Interior, Washington 25, D.C. 1937
Lees-Smith, D(erek) T(hayer), Broadmoor Hospital, Crowthorne, Berkshire, England 1951
LeFebvre, Eugene Allen, 2300 E. Co. Rd. E., White Bear 10, Minnesota 1953
LeFevre, Rufus H(arry), Laurel, Pennsylvania 1927
Legg, Mrs. Dorothy C(ogan), 1823 Irving Ave., S., Minneapolis 5, Minnesota 1950
Leister, Claude W(illard), Pocono Wild Animal Farm, R.R. No. 1, Stroudsburg, Pennsylvania 1916
Lemaire, Robert J., 1445 15th Ave., Vero Beach, Florida 1954
Lemieux, Louis, 1208 Albert Lozeau, Quebec 6, P.Q., Canada 1949
Lemmon, Robert S(tell), Olmstead Hill, Wilton, Connecticut 1950
Lemon, Earl Robert, Department of Zoology, University of Western Ontario, London, Ontario, Canada 1955
Lengemann, Martha A., 360 Cedar St., Imlay City, Michigan 1949
Lenhert, Mr. P(aul) Galen, Department of Biophysics, Johns Hopkins University, Baltimore 18, Maryland 1952
Lenz, Lawrence R., 10725 Borgman Ave., Huntington Woods, Michigan ... 1954
EM Leopold, Dr. A(ldo) Starker, Museum of Vertebrate Zoology, Berkeley 4, California ..... (1940) 1946
Leopold, Frederic, 111 Clay, Burlington, Iowa 1954
Lesperance, Thomas A(ndrew), 75 N. Sable St., Keeseville, New York ... 1951
Lester, Joseph E(vans), R.R. 1, Aliquippa, Pennsylvania 1952
Leupold, Norbert H., 3555 S.E. Insley, Portland 2, Oregon 1946
Levi, Dr. Herbert W., Department of Zoology, University of Wisconsin, Madison 6, Wisconsin 1952
Lewis, Mrs. Alice Hay, 212 N. Wilton Place, Los Angeles 4, California ... 1952

	Lewis, C. Bernard, Science Museum, Institute of Jamaica, Kingston, Jamaica, British West Indies		1947
	Lewis, Eda, P.O. Box 371, Topton, Pennsylvania		1953
LF	Lewis, Dr. Harrison F., West Middle Sable, Shelburne County, Nova Scotia, Canada	(1912)	1942
	Lewis, Joseph S., 86 S. Main St., Box 441, Spring Grove, Pennsylvania		1953
	Lewis, Miss Mary Genevieve, Warren Wilson College, Swannanoa, North Carolina		1954
	Lewis, William O(wen), Ivy, Virginia		1951
	Lidicker, William (Zander) Jr., 468 Riverside Dr., New York 27, New York		1950
	Liebe, Harold J(ohn), 500 Prospect Ave., Hartford 5, Connecticut		1943
	Lieftinck, John E(dmund), c/o Goodyear S.A., Luxembourg City, Luxembourg		1949
	Lien, Boyd M(arten), 5148-29 Ave., S., Minneapolis 17, Minnesota		1951
L	Ligas, Frank J(ohn), P.O. Box 38, Dania, Florida		1951
EM	Ligon, J(ames) Stokley, Box 950, Carlsbad, New Mexico	(1912)	1927
	Lilly, Mrs. A. W. (Elsie P.), 6450 Kenwood Ave., Apt. 212, Chicago 37, Illinois		1950
LF	Lincoln, Frederick C., Fish and Wildlife Service, Department of the Interior, Washington 25, D.C.	(1910)	1934
	Lindau, S. Paul, 108 N. Harvard Blvd., Los Angeles 4, California		1954
	Linford, James B., 538 Fairbanks Ave., Oakland 10, California		1952
F	Linsdale, Dr. Jean M., Jamesburg Route, Carmel Valley, California	(1922)	1945
	Lintereur, LeRoy J., Ranger Station, Wausaukee, Wisconsin		1952
	Linton, M(orris) Albert, 315 E. Oak Ave., Moorestown, New Jersey		1928
	Lisk, Robert Douglas, 372 Brock St., Kingston, Ontario, Canada		1955
	Littahorsky, Anton, 3808 Union Rd., (Afton), St. Louis 23, Missouri		1954
	Livermore, John Walton, P.O. Box 41, West Redding, Connecticut		1947
	Livingston, John A., 99 Madison Ave., Toronto, Ontario, Canada		1955
	Lloyd, Clark K(orner), 11 N. Elm St., Oxford, Ohio		1949
LF	Lloyd, Hoyes, 582 Mariposa Ave., Ottawa, Ontario, Canada	(1916)	1932
	Lloyd, Mrs. Wilmot, 582 Mariposa Ave., Ottawa, Ontario, Canada		1925
	Lockwood, Dr. Robert Minturn, Veterans Administration Hospital, McKinney, Texas		1947
	Loetscher, Dr. Frederick Wm., Jr., 507 W. Main St., Danville, Kentucky		1938
	Long, Mrs. Albert E. (Roberta J.), 45 Clarendon Ave., San Francisco 14, California		1952
	Long, Betty Holmes (Mrs. Harry), Green Brier Rd., RFD 6, Westport, Connecticut		1949
	Long, Ralph Hamilton, Jr., 41 West Broadway, Lincoln, Maine		1952
	Longfield, Mrs. Carl (Tessie Chandon), Sunrise H'way and Irish Lane, East Islip, Long Island, New York		1949
	Longley, William H(oward), P.O. Box 362, Kasson, Minnesota		1943
EM	Longstreet, Robert James, Rt. 2, Box 65C, Deland, Florida	(1923)	1949
	Longwell, John R., Box 8, Solomons, Maryland		1955
	Loomis, Mrs. Hazel Ellis, R.D. 2, Box 157 T, Hammond, Louisiana		1935
	Løppenthin, Bernt, University Library, Dansk Ornithologisk, Forening 2 Dept.-Nr. Alle 49, Copenhagen, Denmark		1928
	Lord, Dr. Frederic P(omeroy), 960 Broadway, Dunedin, Florida		1922
	Loring, George G(ardiner), Bridge St., Manchester, Massachusetts		1949

Loukashkin, A. S., 1210 23rd Ave., San Francisco, California 1941
Lovell, Dr. Harvey B(ulfinch), 2346 Dundee Rd., Louisville 5, Kentucky .. 1943
Lovett, Mrs. Robert A., "Pleasance," Locust Valley, Long Island, New York 1953
M Low, Seth H(askell), Rt. 2, Gaithersburg, Maryland ..... (1930) 1949
Lowe, Kenneth, Flyinglowe Ranch, Rt. 3, Box 130, Boring, Oregon 1955
Lowery, Dr. George Hines, Jr., Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana ..... (1934) 1949
Lownes, Albert E., P.O. Box 1531, Providence, Rhode Island 1924
Ludwig, Charles, Crawford County Institute, Saegerstown, Pennsylvania .. 1949
Ludwig, Claude C., 279 Durand St., East Lansing, Michigan 1947
Ludwig, Dr. F(rederick) E(dwin), 2864 Military St., Port Huron, Mighigan 1949
Ludwig, John Paul, c/o Miss Hopkins, 1041 2nd St., Santa Monica, California 1955
Lueshen, Mrs. John, Wisner, Nebraska 1952
Lukens, William Weaver, Jr., Upper Gulph Rd., Radnor, Pennsylvania ... 1946
Lumsden, H. G., Southern Research Station, Maple, Ontario, Canada 1951
Lundberg, Arnold Edward, RFD No. 1, Walnut Hill, Thomaston, Connecticut 1954
Lundevall, (Adolf) C(arl) F(rederick), Östergötlands Dagblad, Nörrköping, Sweden 1951
Lunk, William A., 2849 Whitewood, Pittsfield Village, Ann Arbor, Michigan 1938
Lupient, Mrs. Mary Louise, 212 S.E. Bedford St., Minneapolis, Minnesota 1946
Luthy, Ferd(inand), Jr., 306 N. Institute, Peoria, Illinois 1937
Luwe, William Ralph, 309 State St., Mankato, Minnesota 1954
Maass, David Arthur, 139 W. Mill St., Owatonna, Minnesota 1955
MacCracken, Mrs. Helen Dolman, Box 115, Estes Park, Colorado 1931
MacDonald, Duncan, 1539 Peterson St., Fort Collins, Colorado 1955
MacDougall, Donald, Rm. 24, Brunswick House, Mount Allison University, Sackville, N.B., Canada 1955
Machen, Mrs. Luther W., 322 Marshall St., Hampton, Virginia 1954
Mack, H. G., c/o Gilson Manufacturing Company, Guelph, Ontario, Canada 1933
Mackay, R(onald) H(ugh), Forestry and Geology Bldg., University of British Columbia, Vancouver, British Columbia, Canada 1950
Mackenzie, Dr. Locke L., 829 Park Ave., New York 21, New York 1946
Mackiewicz, John Stanley, Comstock Hall, Cornell University, Ithaca, New York 1952
Macklin, Paul R., Bryant, Indiana 1954
Mackworth-Praed, C(yril) W(inthrop), Castletop, Burley, near Ringwood, Hants, England 1928
Maclay, Mark W(alton), 76 Beaver St., New York, New York 1905
Maclean, Dorothy W(illiams), 58 Newtown Ave., Norwalk, Connecticut ... 1931
MacPherson, Andrew H(all), Department of Zoology, McGill University, Montreal, Canada 1951
Madison, Samuel R., 14 McGuffey Lane, Delmar, New York 1952
Magann, Joseph Wilbur, 3711 N. McKinley, Oklahoma City 6, Oklahoma .. 1953
Magner, J(ohn) Marshall, 516 Bacon Ave., Webster Groves 19, Missouri . 1948
Magney, Gertrude Blackwell (Mrs. G.R.), 5329 Washburn Ave., S., Minneapolis 10, Minnesota 1950

Maher, William Joseph, 1831 E. 15th St., Brooklyn 29, New York 1953
Mainster, Raymond Waite, 3716 Croydon Rd., Baltimore 7, Maryland 1953
Mair, W(illiam) Winston, 271 Pleasant Park Rd., Ottawa 1, Ontario, Canada 1953
Malcolm, W. C., Trochu, Alberta, Canada 1955
Male, Alan E., 8 Eleanor Rd., Old Colwyn, Denbighshire, North Wales, Great Britain 1955
Mall, Rolf E(mil), Unit No. 11, Humboldt Village, Arcata, California 1952
Mallette, Robert D., 1935 Huston, Marysville, California 1947
Mangels, Frederick P(aul), 708 Farmers Ave., Bellmore, L.I., New York 1953
Manners, Edward R(obert), 216 New Broadway, Brooklawn, New Jersey .. 1941
EM Manning, Thomas H(enry), 37 Linden Terrace, Ottawa, Ontario, Canada ..... (1937) 1949
Mannix, Mrs. Lucille, 3899 East 176 St., Cleveland 28, Ohio 1947
Marble, Richard M(errill), Woodstock, Vermont 1907
Margolin, A(braham) S(tanley), Phoenix College, Biology Department, Phoenix, Arizona 1949
Marionneaux, Alice S(tuntz) (Mrs. Belfort V.), Central Romana Corp., La Romana, Dominican Republic 1941
L Mark, Cyrus, 270 Birch St., Winnetka, Illinois 1952
Mark, James, Moose Factory, Moosonee, Ontario, Canada 1953
Marsh, Charles M., 715 Grove St., Alton, Illinois 1954
Marsh, Mary F., 286 Queen St., W., Guelph, Ontario, Canada 1952
Marshall, David B., Malheur Nat'l. Wildlife Refuge, Burns, Oregon 1942
EM Marshall, Dr. Joe T., Jr., Ponape, Eastern Carolines, Trust Territory of Pacific ..... (1941) 1948
Marshall, Perry R(aymond), Denman Island, British Columbia, Canada .. 1952
Marshall, Raymond O(scar), 256 Ridge St., Leetonia, Ohio 1944
Marshall, Terrell, 372 Skyline Dr., Park Hill, North Little Rock, Arkansas 1944
EM Marshall, Dr. William Hampton, 300 Coffey Hall, University of Minnesota, St. Paul 1, Minnesota ..... (1935) 1950
Martin del Campo, Rafael, Instituto de Biologia, Casa del Lago, Chapultepec, Mexico, D.F., Mexico 1948
Martin, Dr. Donald B., Massachusetts General Hospital, Boston 14, Massachusetts 1954
Martin, Frank R., Foxholm, North Dakota 1953
Martin, H. Bradley, 465 East 57th St., New York 22, New York 1955
Martin, Patrick Waldyve, 90 Valleyview, R.R. 1, Kamloops, British Columbia, Canada 1948
Martola, H. R., Ulkoasisinministerio, Helsinki, Finland 1953
Marvel, Dr. Carl S(hipp), 404 W. Pennsylvania Ave., Urbana, Illinois ... 1951
EM Maslowski, Karl H(erbert), 1034 Maycliff Place, Cincinnati, Ohio . (1935) 1951
Mason, C(harles) N(athan), 6432 31st St., N.W., Washington 15, D.C. .. 1948
EM Mason, C(harles) Russell, 1376 Walnut St., Newton Highlands 61, Massachusetts ..... (1936) 1947
Mason, Edwin A., Arcadia Wildlife Sanctuary, Easthampton, Massachusetts 1943
Mason, Esther E(lizabeth), 2523 Montgomery St., Louisville 12, Kentucky 1952
Mason, Robert F(rench) Jr., Rt. No. 1, Apopka, Florida 1929
Mastin, Dr. Thomas W., Lubrizol Corp., Euclid Station, Cleveland 17, Ohio 1954
Mather, Richard H., 5583 Queen Mary Rd., Hampstead 29, Montreal, Quebec, Canada 1947

Mathews, Dr. Frank P(elletreau), Rt. 6, Box 308, Olympia, Washington ... 1923
L Mathieu, J. A., Rainy Lake, Ontario, Canada 1952
Matousek, Frank, Halenarska 11, Trnava, Czechoslovakia 1953
Matthews, George E., Jr., 33 Argyle Park, Buffalo 22, New York 1954
Matthews, William Henry, Jr., 2 Berkeley Ave., Apt. 2F, Yonkers 5, New York 1948
Mattocks, James (Richardson), Professional Building, High Point, North Carolina 1949
May, Franklin H(insdell), 7401 Baltimore Ave., Takoma Park 12, Maryland 1937
May, Fred H(amilton), 211 Beall St., Lenoir, North Carolina 1952
EM May, Dr. John B(ichard), 325 Main St., Cohasset, Massachusetts . (1916) 1930
Mayfield, Al Heath, 2702 Fairfax Ave., Nashville 12, Tennessee 1954
Mayfield, Dr. George R(adford), Vanderbilt University, Nashville, Tennessee 1917
EM Mayfield, Harold Ford, 2557 Portsmouth St., Toledo 13, Ohio .... (1940) 1950
Mayhew, Wilbur Waldo, Division of Life Sciences, University of California, Riverside, California 1947
LF Mayr, Dr. Ernst, Museum of Comparative Zoology, Harvard University, Cambridge 38, Massachusetts ..... (1929) 1937
L Mazzeo, Rosario, 114 The Fenway, Boston, Massachusetts 1943
FE McAtee, Waldo Lee, 3 Davie Circle, Chapel Hill, North Carolina . (1903) 1913
EM McCabe, Dr. Robert A., 424 University Farm Place, Madison 5, Wisconsin ..... (1946) 1951
McChesney, Donald Stevenson, 405 Piercefield Dr., (Solvay), Syracuse 9, New York 1955
McChesney, Marian Pennock (Mrs. Donald S.), 405 Piercefield Dr., (Solvay), Syracuse 9, New York 1955
McChord, Mrs. John H., 2204 Village Drive, Louisville 5, Kentucky 1955
McClung, Robert M(arshall), Adelphi Ave., Harrison, New York 1949
McClure, H(owe) Elliott, 406 Med. Gen. Lab., APO 500, San Francisco, California 1942
McClure, J(ohn) F(rancis), 7050 N. Oatman Ave., Portland 17, Oregon ... 1951
McConnell, Harry B(urns), 142 E. Warren St., Cadiz, Ohio 1947
McConoughey, Frank P., 1547 Northland Ave., Lakewood 7, Ohio 1953
HL McCook, Philip James, 25 East End Ave., New York 22, New York 1895
McCormick-Goodhart, L(eander), Bellapais, 610 E. Boulevard Dr., Alexandria, Virginia 1927
McCoy, Mrs. Sterling L. (Marguerite W.), R.R. 1, Box 250, Elgin, Illinois 1952
McCue, Earl N(ewlon), P.O. Box 104, Morgantown, West Virginia 1949
McCullagh, Dr. E. Perry, Cleveland Clinic, 2020 E. 93rd St., Cleveland 6, Ohio 1954
McDonald, Dr. George V., Apple Hill, Ontario, Canada 1952
McElroy, Thomas P. Jr., The Pequot-sepos Wildlife Sanctuary, Pequot-sepos Ave., Mystic, Connecticut 1947
McEntee, Elinor G. (Mrs. Howard G.), 490 Fairfield Ave., Ridgewood, New Jersey 1949
McGaw, Mrs. G. H(ampton) (Elizabeth T(aylor)), 18 Beech St., Woodsville, New Hampshire 1949
McGeen, Dr. Daniel S., 707 Community National Bank Bldg., Pontiac, Michigan 1945
McGowan, Terry A(llen), 472 East Main St., Lexington, Kentucky 1952

McGranahan, Miss Marjorie M., 3352 Ardenridge Dr., Sacramento 21, California 1952
McIlvain, John F(olwell), 141 E. Maple Ave., Langhorne, Pennsylvania ... 1949
McIlwaine, William B(aird), Jr., "Sysonby," R.R. 4, Petersburg, Virginia 1933
McIlwraith, T(homas) F(orsyth), 30 Strathallan Blvd., Toronto 12, Ontario, Canada 1933
McKay, Neil, 38 S. Dearborn St., Rm. 1400, Chicago 3, Illinois 1955
McKay, Reg(inald) R., P.O. Box 574, Arlington, Florida 1949
McKeever, Mrs. Katharine R(yan), P.O. Box 62, Water Mill, New York ... 1951
McKinley, Daniel Lawson, University of Missouri, Stephens Hall, Columbia, Missouri 1952
McKinney, Dr. D. Frank, Delta Waterfowl Research Station, Delta, Manitoba, Canada 1955
McKittrick, Thomas Harrington, Slate Falls, Blairstown, R.D. 2, New Jersey 1928
McKnight, Edwin T(hor), 5038 Park Place, Washington 16, D.C. 1947
McLaughlin, Frank Winnifred, 923 White Horse Pike, Apt. B, Oaklyn 6, New Jersey 1947
McLaughlin, Vincent P., Jr., R.R. 2, Center Road, Poland, Ohio 1938
McLean, Donald D(udley), 2455 Cottle Ave., San Jose 25, California 1930
McLeod, John A(llen), Jr., 113 E. Hendrix St., Greensboro, North Carolina 1950
McLeod, Kenneth, Jr., 413 High St., Klamath Falls, Oregon 1955
McLeron, Mrs. Heidi, Box 1007, Prescott, Arizona 1954
McMillan, Eben, Cholame, California 1947
McMillan, Ian I(rving), Box 63, Shandon, California 1947
McMillan, W(illiam) G(arrett), Box 1447, Lubbock, Texas 1949
McMillan, William R(enton), 12701 12 Ave., N.W., Seattle 77, Washington 1938
McNabb, Miss Mary K., Springdale Community Hospital, Springdale, Arkansas 1954
McQuate, Miss Nelda Jean, 374 Riverside Dr., Tiffin, Ohio 1953
McRae, Charles, Route 2, Austell, Georgia 1953
Meacham, Frank B., North Carolina State Museum, Raleigh, North Carolina 1947
Meade, Dr. Gordon M(ontgomery), Trudeau Sanatorium, Trudeau, New York 1936
Meadows, Barry, 206 Portage Rd. North, Niagara Falls, Ontario, Canada . 1955
EM Meanley, M. Brooke, P.O. Box 1365, Alexandria, Louisiana ..... (1935) 1952
Means, Robert Whitman, Topsfield, RFD, Massachusetts 1955
L Medcalf, Robert, 1824 S.W. 11th Ave., Portland 1, Oregon 1943
Medina, Don R., 364 Roswell, Long Beach, California 1955
Mehner, John F(rederick), 1003 James St., Pittsburgh 34, Pennsylvania ... 1948
Meitzen, Logan Herman, Box 1022, Angleton, Texas 1953
Meitzen, Dr. Travis C., Box 308, Refugio, Texas 1942
Mellinger, Enos Oren, Savannah N.W. Refuge, Box 4008, Port Wentworth, Georgia 1940
Menaboni, Athos, 1111 Cook Rd., R. 10, Atlanta, Georgia 1947
Menaboni, Sara, 1111 Cook Rd., R. 10, Atlanta, Georgia 1947
F Mendall, Howard L(ewis), Maine Coop. Wildlife Res. Unit, 121 East Annex, University of Maine, Orono, Maine ..... (1934) 1954
Menefee, Emory, 5600 Paraquay St., El Paso, Texas 1950
L Meng, Heinz, New Paltz Teachers College, New Paltz, New York 1944

EM Mengel, Robert M., Museum of Natural History, University of Kansas, Lawrence, Kansas ..... (1938) 1951
Menninger, Philip B., 1724 Collins Ave., Topeka, Kansas 1954
Merck, George W., Caixa Postal 2584, Rio de Janeiro, Brazil 1955
Meredith, Rex, 121 Monckton Ave., Quebec, Canada 1927
Merkel, Robert S(ydney), 407 Main St., West Point, Kentucky 1953
Meritt, James K., 901 State St., Schenectady, New York 1942
Merriam, H. Gray, 635 Woolwich St., Guelph, Ontario, Canada 1955
Mers, Wm. H., 1659 Marlowe Ave., Cincinnati 24, Ohio 1951
Metcalf, Homer N(oble), Department of Horticulture, Montana State College, Bozeman, Montana 1946
Metcalf, Dr. Isaac S.H., The Citadel, Charleston, South Carolina 1955
Mewaldt, Leonard Richard, Department of Natural Sciences, San Jose State College, San Jose, California 1947
L Meyer, Miss Heloise, Lenox, Massachusetts 1913
Meyer, Dr. Henry, 307 Spaulding Ave., Ripon, Wisconsin 1944
Meyerriecks, Andrew J(oseph), Biological Laboratories, Harvard University, Cambridge 38, Massachusetts 1948
L Meyers, Dr. Kenneth Lewis, 2222 Far Hills Ave., Dayton 9, Ohio 1953
Michaud, Ted Corneille, 615 Oswego, Ann Arbor, Michigan 1955
Michener, Josephine R. (Mrs. Harold), 418 N. Hudson Ave., Pasadena 4, California 1950
Mickey, Arthur B., 1516 Rainbow Ave., Laramie, Wyoming 1936
Middleton, Mrs. Archie D., Brady, Nebraska 1952
Middleton, R(aymond) J(ones), 131 N. Whitehall Rd., Norristown, Pennsylvania 1920
Migdalski, Edward C., Box 2025, Yale Station, Yale University, New Haven, Connecticut 1946
Miles, M(erriam) L(ee), Chamber of Commerce, Daytona Beach, Florida . 1941
Millar, John Burton, Department of Zoology, University of Wisconsin, Madison, Wisconsin 1954
LF Miller, Dr. Alden Holmes, Museum of Vertebrate Zoology, University of California, Berkeley 4, California ..... (1929) 1939
Miller, Mrs. Clarence H(eath), 1354 Herschel Ave., Cincinnati 8, Ohio ... 1939
Miller, Clark, Inwood, West Virginia 1951
L Miller, Douglas Scott, 122 Lawrence Ave. East, Toronto, Ontario, Canada 1938
Miller, Dr. John R., 712 N. Peach Ave., Fresno 1, California 1946
LF Miller, Dr. Loye H(olmes), Museum of Vertebrate Zoology, Berkeley 4, California ..... (1918) 1930
Miller, Lyle DeVern, 5795 Mill Creek Blvd., Youngstown 12, Ohio 1947
Miller, Richard F(ields), 2627 N. 2nd St., Philadelphia 33, Pennsylvania .. 1952
EM Miller, Dr. Robert C(unningham), California Academy of Sciences, San Francisco 18, California ..... (1935) 1942
Miller, William R(osewarne), Fish and Game Service, R.F.D. 1, Milton, Vermont 1949
Miller, Mrs. Wilmer J. (Lotus Simon), 530 E. 9th St., Davis, California . 1955
Mills, Dudley H(olbrook), Glen Head, Long Island, New York 1929
Mills, Dr. Harlow B(urgess), Natural History Survey, Urbana, Illinois ... 1949
Mills, Herbert H., Arrowhead Farms, Bridgeton, R.D. 3, New Jersey ... 1955
Mills, Mrs. Peter J. (Nancy M.), R.R. 2, Chesterton, Indiana 1950
Mills, W(illett) J(ames), 100 Spring Garden Rd., Halifax, Nova Scotia, Canada 1953
Milnes, Herbert, Box 48, P.O. No. 1, Woodstock, Ontario, Canada 1952

Minard, Elbridge A., 25 Maple St., Auburndale 66, Massachusetts 1954
Minich, Edward C(onrad), 1047 Fairview Ave., Youngstown 2, Ohio 1949
Miskimen, Miss Mildred, Department of Physiology, Miami University, Oxford, Ohio 1951
LEM Mitchell, Harold D(ies), 378 Crescent Ave., Buffalo, New York ... (1930) 1949
L Mitchell, Mrs. Osborne S. (Margaret H.), c/o COBAST, Caixa Postal 4965, Rio de Janeiro, Brazil 1928
HL Mitchell, Dr. Walton L(ungerich), 398 Vassar Ave., Berkeley 8, California 1893
Moffatt, Arthur Roy, Norwich, Vermont 1953
Mohr, Mrs. Carol B(urden), R.F.D. No. 3, Mahopac, New York 1952
Mohr, Charles Edward, Audubon Center, Quaker Ridge, Greenwich, Connecticut 1942
Mohr, Mrs. Robert F., Lake Shore Drive, Lake Lincolndale, Somers, New York 1954
Monk, H(arry) C(rawford), 406 Avoca St., Nashville 5, Tennessee 1921
EM Monroe, Burt L(eavelle), Ridge Rd., Anchorage, Kentucky ..... (1935) 1947
Monroe, Lt.(jg) Burt L., BOQ, U.S. Naval Air Station, Pensacola, Florida. 1953
Monroe, Dr. James, Ray Brook, New York 1940
Monroe, Morgan C., 2802 North 21st St., Phoenix, Arizona 1954
EM Monson, Gale (Wendell), P.O. Box 1032, Yuma, Arizona ..... (1937) 1950
Montague, Mrs. Robert P., 49 Spring St., Southbridge, Massachusetts 1953
Montgomery, Carl E(dwin), 547 N. 8th St., Allentown, Pennsylvania 1944
Montgomery, George Hugh, 4689 Westmount Ave., Westmount, Quebec, Canada 1947
Montgomery, John Earl, 53 S. Mt. Vernon Ave., Uniontown, Pennsylvania . 1954
Moody, A(delbert) J(ohn), c/o Aetna Life Insurance Co., Hartford, Connecticut 1918
L Moody, Olive B(eauchamp), 510 River Rd., Beaver, Pennsylvania 1949
Moody, R(ollin) W(ayne), 1169 Colorado Blvd., Denver 6, Colorado 1949
Moon, D. A., 1941 Portage Ave., Winnipeg, Manitoba, Canada 1953
Moon, Jennie S(ennett), 4107 W. Woodbine St., Chevy Chase 15, Maryland . 1949
Moon, Dr. Neil S(ennett), 257 Pemberton Road, Rochester 9, New York ... 1949
Moore, James R(ichards), Old-Saybrook, Connecticut 1937
Moore, Joseph C(urtis), Everglades Natural History Association, Box 275, Homestead, Florida 1952
Moore, Robert B(yron), 1332 Alfred St., Baton Rouge, Louisiana 1949
LF Moore, Robert Thomas, Laboratory of Zoology, Occidental College, Los Angeles 41, California ..... (1898) 1940
Moore, Tilford, 2265 Carter Ave., St. Paul 8, Minnesota 1945
Morejohn, Gonzalo Victor, Department of Zoology, University of California, Davis, California 1947
Moreno, Dr. Albelardo, Museo Poey, Catedra "U", Escuela de Ciencias, Universidad de la Habana, Havana, Cuba 1942
Morgan, Allen H., Cochituate Rd., Wayland, Massachusetts 1947
L Morgan, John Sage, 38 Garrison Rd., Brookline, Massachusetts 1927
Morine, Alfred M(onroe), Hennepin, Illinois 1949
Morioka, H(iroyuki), No. 114, Nonakashinden, 483, Kodaira, Tokyo, Japan 1950
Morland, Thomas F(rancis) T(hornhill), 1 Ogilivie St., Halifax, Nova Scotia, Canada 1952
Morrison, Alva, 2 Garden Terrace, Cambridge 38, Massachusetts 1945
Morrison, Kenneth Douglas, R.F.D. 1, Armonk, New York 1947
Morrow, Mrs. John, Jr., (Dessie Powers), 1320 N. State St., Chicago 10, Illinois 1945

Morse, Miss Margarette E(lthea), 122 W. South St., Viroqua, Wisconsin .. 1919
Mortensen, Hemming, 217-12 102nd Ave., Queens Village, New York 1953
LEM Moser, Dr. R(euben) Allyn, 911 S. 89th St., Omaha 6, Nebraska .. (1940) 1947
Moses, Dr. Leon, 19 East 74th St., New York 21, New York 1948
Moski, Henry C(harles), Jr., 20 St. James St., Hamden 14, Connecticut .. 1952
Mossman, Dr. Archie S(tanton), Box 1185, Douglas, Alaska 1955
Mostoller, Ralph V(ickroy), 1 Cleveland St., Johnstown, Pennsylvania 1936
Moulton, Francis S(evern), 14 Acorn St., Boston 8, Massachusetts 1926
Moulton, Francis Severn, Jr., 2 Elm St.. Concord, Massachusetts 1947
Mountfort, Guy, Hartley House, Woldingham, Surrey, England 1953
Movsesyan, Kevork H., 272 Broad Ave., Leonia, New Jersey 1955
Moyer, Cpl. Jack T(homson), 32 Montgomery Street, Hamilton, New York . 1952
Moynihan, Martin H., Fernow Hall, Cornell University, Ithaca, New York 1954
L Mudge, Edmund W., Jr., 5926 Averill Way, Dallas 5, Texas 1947
Mudge, Eugene, R.F.D. 1, Northport, New York 1953
Mueller, Helmuth, 2756 N. Palmer St., Milwaukee 12, Wisconsin 1948
Muggenburg, Bruce A., 1609 S. Hawthorn, Sioux Falls, South Dakota 1952
Muhlback, W. L., 105-1/2 S. State St., Aberdeen, South Dakota 1954
Muir, A(llister), c/o Royal Bank of Canada, Broadway and Cambia, Vancouver, B.C., Canada 1955
Mulligan, Walter F., 9210 49th Ave., College Park, Maryland 1947
Mulloy, Elizabeth J., 4824 So. 29th St., Arlington 6, Virginia 1947
Mulloy, Miss Elizabeth M., Box 1014, Texas City, Texas 1955
Mumford, Russell Eugene, c/o Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1954
Munro, David Aird, Canadian Wildlife Service, 150 Wellington Street, Ottawa, Canada 1947
EM Munro, George C(ampbell), 3029 Hibiscus Drive, Honolulu 15, Hawaii (1939) 1945
F Munro, James Alexander, Okanagan Landing, British Columbia .... (1913) 1941
Munter, Rear Admiral W(illiam) (Henry), 4518 52nd Ave., N.E., Seattle 5, Washington 1927
Murdock, James (Ingram), 311 Irving Ave., Glendale 1, California 1943
Murdy, H(oratio) W(illiams), P.O. Box 560, Webster, South Dakota 1949
EM Murie, O(laus) J(ohan), Moose, Wyoming ..... (1913) 1934
Murphy, Grace E(meline) Barstow (Mrs. Robert C.), "Briarlea", Old Field, Setauket, New York 1919
Murphy, Joseph Robison, 625 South 51st St., Lincoln 10, Nebraska 1952
Murphy, Paul Charles, 935 Goodrich Ave., Apt. 10, St. Paul 5, Minnesota . 1954
F Murphy, Dr. Robert Cushman, "Briarlea", Old Field, Setauket, Long Island, New York ..... (1905) 1920
Murray, Dougald, R.R. No. 1, Melbourne, Ontario, Canada 1952
EM Murray, J(oseph) J(ames), 6 White St., Lexington, Virginia ..... (1928) 1936
Murray, Miss Lucy H., Regina College, Regina, Saskatchewan, Canada .. 1955
Musgrove, Jack W(arren), 2414 Adams St., Des Moines, Iowa 1946
Musselman, Dr. T(homas) E(dgar), 124 S. 24th St., Quincy, Illinois 1922
Myers, Buford M(acMartin), Jr., 45 Oakland St., New Orleans 23, Louisiana 1952
Myers, Everett C., Curator of the Museum, Bowling Green State University, Bowling Green, Ohio 1924
Myklebust, Roy J(ohn), 723 Warne, Festus, Missouri 1948
Myres, Miles Timothy, Department of Zoology, University of British Columbia, Vancouver 8, British Columbia, Canada 1955
Nagra, Clarence Lawrence, Zoology Department, Washington State College, Pullman, Washington 1954

Naumburg, Walter W(ehle), 121 E. 64th St., New York 21, New York 1923
Neal, Mrs. Charles, Box 133, Demorest, Georgia 1946
Neess, John Carl, Department of Zoology, Birge Hall, University of Wisconsin, Madison, Wisconsin 1948
EM Neff, Johnson A(ndrew), Wildlife Research Laboratory, Bldg. 45, Denver Federal Center, Denver 2, Colorado ..... (1919) 1951
Neher, Harry T(rainor), 817 Radcliffe St., Bristol, Pennsylvania 1951
Nelson, Mrs. Almer P., National Elk Refuge, Jackson, Wyoming 1949
Nelson, Mrs. Charles E., Jr., 124 Oxford Rd., Waukesha, Wisconsin 1938
Nelson, Mrs. Edith T., 650 Blair Ave., Piedmont 11, California 1952
Nelson, G(ideon) E(dmund), Jr., Department of Biology, Alabama College, Montevallo, Alabama 1949
Nelson, Harry P(eter), 835 N. Cass St., Milwaukee 2, Wisconsin 1948
Nelson, Harvey K., Fish and Wildlife Service, P.O. Box 728, Saginaw, Michigan 1953
L Nelson, Dr. Theodora, 315 E. 68th St., New York 21, New York 1927
EM Nero, Robert W(illiam), Dept. of Natural Resources, Saskatchewan Museum of Natural History, Regina, Saskatchewan ..... (1950) 1955
Ness, Robert D(avid), 17 Five Points Rd., Rush, New York 1951
Nessle, James P(hilip), R.F.D. No. 1, Waterville, Ohio 1949
Netherton, Hazel I.M. (Mrs. Clifford L.), 3718 First Road South, Arlington, Virginia 1947
Neu, Dr. Harold N., 506 No. Elmwood Rd., Omaha 3, Nebraska 1952
New, John G., Fernow Hall, Cornell University, Ithaca, New York 1946
Newberry, A(ndrew) Todd, 70 Rock Spring Rd., West Orange, New Jersey 1952
Newill, Dr. D. S., P.O. Box 634, Connellsville, Pennsylvania 1949
EM Newman, Robert J(ames), Zoology Department, Louisiana State University, Baton Rouge, Louisiana ..... (1943) 1952
LF Nice, Mrs. Margaret Morse, 5725 Harper Ave., Chicago 37, Illinois ..... (1920) 1937
EM Nichols, Charles K(etcham), 212 Hamilton Rd., Ridgewood, New Jersey ..... (1931) 1948
Nichols, Mrs. Charles K., 212 Hamilton Rd., Ridgewood, New Jersey 1933
LEM Nichols, John Treadwell, American Museum of Natural History, 79th St. and Central Park West, New York 24, New York ..... (1901) 1914
Nichols, Mrs. Una G., 3405 33rd St., San Diego, California 1954
Nichols, William Wallace, 515 Seaview Place, Vista, California 1950
Nicholson, Donald John, 1224 Palmer St., Orlando, Florida 1947
Nickell, Walter P(rine), Cranbrook Institute of Science, Bloomfield Hills, Michigan 1941
EM Niedrach, Robert J(ames), Box 116A, R.R. No. 3, Littleton, Colorado ..... (1940) 1944
Nielsen, Joseph A(ustin), 253 Warren St., Brooklyn 2, New York 1953
Nielsen, Beatrice W., Nielsen Reservation, Rt. 1, Box 808, Red Bluff, California 1949
Niosi, Nicholas, 65 Park Ave., Bloomfield, New Jersey 1953
Niper, Gail Broughton (Mrs. Leonard C.), 99 Ridgewood Rd., Clifton, New Jersey 1949
Nolan, James R., 14 Edgewood Rd., Peekskill, New York 1953
Nolan, Thomas B(rennan), U.S. Geological Survey, Washington 25, D.C. . 1935
Nolan, Val, Jr., Indiana University School of Law, Bloomington, Indiana .. 1952
Noland, Mrs. Hulbert V., Indian Hills Trail, Louisville 7, Kentucky 1954
Nooe, Miss Sarah M., Queens College, Charlotte 7, North Carolina 1954

Norby, Darwin E(mil), Department of Genetics, Iowa State College, Ames, Iowa 1950
Nordby, Arthur Leroy, Star Route 1, Box 183, Bremerton, Washington 1955
Noren, Oscar B., 25415 Powers Rd., Farmington, Michigan 1947
Norman, Edward d'A(ubigny), Old Deerfield, Massachusetts 1951
Norris, Robert A(llen), Department of Zoology, University of Georgia, Athens, Georgia 1939
North, George W(ebster), 249 Charlton Ave., W., Hamilton, Ontario, Canada 1938
Northrop, Mrs. Harson A., 358 E. Main St., Owatonna, Minnesota 1952
Northrop, Myron, 9304 Sylvan Hills Rd., North Little Rock, Arkansas 1949
Northwood, John d'Arcy, Mill Grove, Audubon, Pennsylvania 1946
Norton, Mrs. Donald H., Box 157, Geneva, Florida 1954
Novaes, Fernando (da) C(osta), Rua Toneleiros 186, Apt. 303, Copacabana, Rio de Janeiro, Brazil 1949
Novy, Dr. Frank O., 420 S. Jefferson Ave., Saginaw 6, Michigan 1952
Nozicka, George, Men's Quadrangle, Box 266, Indiana University, Bloomington, Indiana 1955
Nutt, David C., Dogford Rd., Etna, New Hampshire 1938
Nyc, Frederick F(rancis), P.O. Box 451, McAllen, Texas 1939
EM Oakeson, Dr. Barbara Blanchard, University of California, Santa Barbara College, Goleta, California ..... (1947) 1951
Oates, Mrs. Norma C., 5908 Charlotte St., Houston 5, Texas 1955
LF Oberholser, Dr. Harry C(hurch), 2933 Berkshire Rd., Cleveland Heights, Cleveland 18, Ohio ..... (1888) 1902
Oberly, Donald B., R.R. 2, Urbana, Ohio 1947
O'Brien, Paul J(oseph), 315 Grove St., Haddonfield, New Jersey 1953
O'Connell, Thomas B., 7 Pittsmore Road, Roslindale, Massachusetts 1952
Odom, Babette Moore (Mrs. Edgar R.), P.O. Box 458, Orange, Texas 1949
F Odum, Dr. Eugene P(leasants), University of Georgia, Athens, Georgia ..... (1932) 1951
Oehser, Paul Henry, Smithsonian Institution, Washington 25, D. C. 1940
Oeming, Albert F., 8448-136 St., Sub. P.O. 23, Edmonton, Alberta, Canada 1954
Olivares, Father Antonio, Colegio del Virrey Solis, Calle 73 No. 10-45, Bogota, Colombia, South America 1952
Oliver, James H., Jr., Box 145, Waynesboro, Georgia 1953
Olmstead, Rossiter D., 1323 Fern St., New Orleans 18, Louisiana 1952
Olsen, Dr. Richard E(llsworth), 3325 Franklin Rd., R. No. 3, Pontiac, Michigan 1949
Olson, Leo B(ernie), 835 S. First St., Dekalb, Illinois 1949
Olson, Mrs. Simon (Gladys Elizabeth), 33 Harvard Dr., Lake Worth, Florida 1951
Ommanney, Geoffrey G(ream), Hudson Heights, Quebec, Canada 1941
O'Neil, Mrs. Norah Selby, 1311 Bonham St., Commerce, Texas 1948
Orbison, Douglas Campbell, Guard Hill Rd., Mt. Kisco, New York 1947
O'Regan, Miss Jane D., 23 Crockett Ave., Dorchester 24, Massachusetts . 1955
O'Reilly, R(alph) A(nthony), Jr., Box 132, Davisburg, Michigan 1940
Orenstein, Joseph J., 17-33 160th St., Whitestone 57, New York 1953
Oresman, Stephen B(ergel), 115 Central Park West, New York 23, New York 1948
Oring, Lewis Warren, 1-f Westway, Greenbelt, Maryland 1954
Ormondroyd, Jesse, 2104 Copley Ave., Ann Arbor, Michigan 1949

Orr, Miss E(mma) Virginia, N. Valley Rd., Paoli, Pennsylvania 1939
EM Orr, Dr. Robert T(homas), California Academy of Sciences, Golden Gate Park, San Francisco 18, California ..... (1937) 1941
Orr, Miss Toni, Marlboro College, Marlboro, Vermont 1955
Orth, John C., Trailside Museum, Bear Mountain, New York 1936
Osgood, Dr. Howard, 188 Anderson Place, Buffalo 22, New York 1954
Oswald, Stanley J. D., 260 Wellington Crescent, Winnipeg, Manitoba, Canada 1954
Overing, Robert, R.F.D. No. 4, Raleigh, North Carolina 1929
Owre, Oscar T(heodore), Department of Zoology, University of Miami, Coral Gables, Florida 1934
L Pack, Arthur Newton, Ghost Ranch, Abiquiu, New Mexico 1929
Packard, Christopher M(oore), Portland Museum of Natural History, Elm St., Portland, Maine 1952
Packard, Fred M(allery), National Parks Assoc., 2144 P St., N.W., Washington 7, D. C. 1935
Packard, Robert Lewis, Kansas Museum of Natural History, Lawrence, Kansas 1953
Paff, Dr. William A(lfred), 2601 E. Jackson Blvd., Elkhart, Indiana 1927
Paeske, Gordon L., 522 - 12th Street, Watertown, Wisconsin 1955
Paine, Charles J., Old Road, Weston, Massachusetts 1954
Paine, Robert T(reat), III, 2 Hubbard Park, Cambridge, Massachusetts ... 1950
Pallas, Miss Dorothy Constance, 107 Jefferson St., Wood-Ridge, New Jersey 1951
LEM Palmer, Dr. Ralph S(imon), New York State Museum, State Education Bldg., Albany 1, New York ..... (1932) 1947
HL Palmer, Samuel Copeland, Swarthmore College, Swarthmore, Pennsylvania 1899
Palmer, Mrs. Theodore Sherman (Bertha Ellis), 1939 Biltmore St., N.W., Washington, D. C. 1918
Palmer, Wayne Newman, 1135 Linwood Place, Utica 3, New York 1952
Palmquist, C(larence) O(scar), 834 Windsor Rd., Glenview, Illinois 1950
Paludan, Dr. Knud, Vildtbiologisk Station, Kalo, Ronde, Denmark 1953
Papurt, Miss Myrel A., 3379 Chalfant Rd., Cleveland 20, Ohio 1955
Park, Charles F(rederick) Jr., Department of Geology, Stanford University, Palo Alto, California 1936
Parker, Clarence J., 821 N. Garfield Ave., Alhambra, California 1947
Parker, Harry C(larence), c/o National Park Service, Fort Klamath, Oregon 1927
Parker, Henry M(elville), Wayland, Massachusetts 1940
EM Parkes, Dr. Kenneth Carroll, Section of Birds, Carnegie Museum, Pittsburgh 13, Pennsylvania ..... (1947) 1953
Parks, Richard A., 2303 Pembrook Pl., N.E., Atlanta, Georgia 1947
Parmelee, David F(reeland), 209-1/2 W. Duffy St., Norman, Oklahoma ... 1948
Parmalee, Dr. Paul W., Department of Zoology, Illinois State Museum, Springfield, Illinois 1953
Parsons, Thomas Sturges, 15 Godwin Ave., Ridgewood, New Jersey 1953
Parsons, William G., P.O. Box 386, Ely, Nevada 1954
L Partridge, William H., Belgrano 363, Caseros F.C.S.M., Buenos Aires, Argentina 1953
Patten, Bernard C(larence), Jr., P.O. Box 167, Braddock Heights, Maryland 1950
Patten, Dr. John A., Box 396, Department of Biology, Middle Tennessee State College, Murfreesboro, Tennessee 1948

	Patterson, Miss Clarice E., Dudley St., Hampden, Maine		1952
	Paul, Lucius H., 51 Riverview Place, Rochester 8, New York		1908
	Paulson, C.W. Geoffrey, The Monotype Corp. Ltd., Salfords, Redhill, Surrey, England		1947
	Paulson, Dennis R(oy), 7280 S.W. 9th St., Miami 44, Florida		1952
	Payne, Miss Rinda-Mary, Box 320, R.F.D. 4, Portland, Maine		1955
EM	Paynter, Dr. Raymond A(ndrew), Jr., Museum of Comparative Zoology, Harvard University, Cambridge 33, Massachusetts	(1946)	1952
L	Peabody, James B(ishop), 115 East 35th St., New York 16, New York		1940
	Peake, Cyril Blackett, Apt. 302, 1445 Kingston Rd., Toronto 13, Ontario, Canada		1952
	Peake, Richard Henry, Jr., Route 4, Box 292, Norfolk 6, Virginia		1954
	Pearse, Theed, Comox, Vancouver Island, British Columbia, Canada		1926
	Pearson, Allen M(obley), P.O. Box 1031, Auburn, Alabama		1940
	Pearson, C. E., 632 North Stone Ave., La Grange Park, Illinois		1954
	Peelle, Miles L., 1039 College Ave., Adrian, Michigan		1948
	Peffer, Mrs. Thomas A., 49 West Depot St., Hellertown, Pennsylvania		1953
	Pelch, William E., 5016 W. 25th Place, Cicero 50, Illinois		1955
L	Pell, Walden, II, St. Andrews School, Middletown, Delaware		1938
	Peloubet, Mrs. Sidney W., Moose Hill Rd., Guilford, Connecticut		1939
F	Pemberton, John Roy, 714 W. Olympic Blvd., Los Angeles 15, California	(1918)	1953
	Penberthy, Alan H., 21 Rutland Rd., Freeport, New York		1954
	Pennington, Tully S(anford), Box 74, Collegeboro, Georgia		1952
	Pepall, Robert L., 29 Wilberton Rd., Toronto 7, Ontario, Canada		1952
	Pepper, William, 20 E. Bells Mill Rd., Philadelphia 18, Pennsylvania		1930
	Pequegnat, Willis E(ugene), Department of Zoology, Pomona College, Claremont, California		1948
L	Perkins, Dr. Anne E(lizabeth), 16 Sewall Rd., South Berwick, Maine		1917
	Perry, Alfred Eugene, 4724 Franklin Road, Boise, Idaho		1953
	Perry, Frances, Green, Rhode Island		1949
	Person, Elmer (G.), 406 Cleveland Avenue, Ishpeming, Michigan		1949
	Pessino, Catherine M., 630 Gramatan Ave., Mt. Vernon, New York		1952
EM	Peters, Harold S(eymour), 968 Cumberland Rd., N.E., Atlanta 6, Georgia	(1924)	1947
	Peters, Stuart S., Cape Broyle, Newfoundland, Canada		1951
	Petersen, Arnold J(erome), 712 W. Third St., Northfield, Minnesota		1951
	Petersen, Peter C., Jr., 620 E. 30th St., Davenport, Iowa		1952
	Petersen, Warren M(ichael), Box 285, Brigham City, Utah		1952
	Peterson, Alfred, Box 201, Brandt, South Dakota		1920
	Peterson, Arthur S., 40 Overlook Rd., Cedar Grove, New Jersey		1952
	Peterson, Lawrence M(inor), So. Ave. Extension, Bradford, Pennsylvania		1949
LF	Peterson, Roger Tory, Neck Road, Old Lyme, Connecticut	(1929)	1948
LF	Pettingill, Dr. Olin Sewall, Jr., Wayne, Maine	(1930)	1947
	Pettit, Lincoln C(oles), Box 217, Hiram, Ohio		1949
	Pettock, Anne G(race), 104 North 10th St., Allentown, Pennsylvania		1950
	Peyton, Sidney Burns, R.R. 2, Box 260, Fillmore, California		1946
	Phelps, James H(arvey) Jr., 717 S. Fourth Ave., Pocatello, Idaho		1933
L	Phelps, Mrs. Kathleen Deery, Apartado 2009, Caracas, Venezuela		1949
F	Phelps, William H., Apartado 2009, Caracas, Venezuela	(1937)	1952
LEM	Phelps, William H., Jr., Apartado 2009, Caracas, Venezuela	(1940)	1948
	Philips, John B., 3260 Netherland Avenue, New York 63, New York		1953
LEM	Phillips, Dr. Allan R(obert), 113 Olive Rd., Tucson, Arizona	(1932)	1946

Phillips, Homer Wayne, 2110 Morse St., Houston 19, Texas 1948
Phillips, Richard E(dward), 415 N. Court St., Crown Point, Indiana 1949
Phillips, Richard S(tuart), 834 Liberty St., Findlay, Ohio 1946
Phillips, William B., 137 W. 81st St., New York 24, New York 1950
Pickens, Dr. A(ndrew) L(ee), Queens College, Charlotte, North Carolina .. 1949
Pickering, Robert, 66 Menno St., Waterloo, Ontario, Canada 1948
Pielou, William P., 1549 Ann St., East Lansing, Michigan 1953
Pieratt, James F., 809 West Otoe, Ponca City, Oklahoma 1955
EM Pierce, Fred John, Winthrop, Iowa ..... (1948) 1950
L Pierce, Robert Allen, Department of Fish and Wildlife Resources, Kentucky Experimental Game Farm, Rt. 2, Frankfurt, Kentucky 1941
EM Pirnie, Dr. Miles D., Conservation Bldg., Michigan State University, East Lansing, Michigan ..... (1919) 1937
F Pitelka, Dr. Frank A(lois), Museum of Vertebrate Zoology, University of California, Berkeley 4, California ..... (1937) 1948
Pittman, James A(llen), 1138 Overbrook Dr., Orlando, Florida 1947
EM Plath, Karl, 110 S. Wesley Ave., Oak Park, Illinois ..... (1925) 1950
Platt, Charles, Jr., Allenby Farm, New Hope, Pennsylvania 1954
Platt, Dwight Rich, A.F.S.E. Barpali Village Serv., Barpali, Sambalpur, Orissa, India 1953
Platt, William, Devon and Grubb Roads, Paoli, Pennsylvania 1949
HL Poe, Miss Margaretta, Earl Court, St. Paul and Preston Sts., Baltimore, Maryland 1899
Polka, Leon Brayton, 1517 Ash St., Forest Grove, Oregon 1955
Pomeroy, F(red) E(lmer), 342 College St., Lewiston, Maine 1920
Poole, Cecil A(very), 1764 Topeka Ave., San Jose 26, California 1941
EM Poole, Dr. Earl L(incoln), Public Museum, Reading, Pennsylvania . (1916) 1942
Poole, Frederick P., 427 Audubon Ave., Audubon 6, New Jersey 1954
LEM Poor, Hustace Hubbard, 7 Colonial Court, New Canaan, Connecticut (1934) 1950
Pope, Lillian Gorzycki, R.F.D. No. 1, Buzon No. 38, Rio Piedras, Puerto Rico 1948
Porter, Eliot F(urness), Great Spruce Head Island, Sunset, Maine 1947
Porter, Michael J., 89 Ridge Dr., Toronto 7, Ontario, Canada 1954
Porter, Richard Dee, Dept. of Wildlife Management, Agricultural & Mechanical College of Texas, College Station, Texas 1948
Porter, T(homas) Wayne, Department of Zoology, Michigan State University, East Lansing, Michigan 1937
Pospichal, Leo B., Pte. Mouillee State Game Area, R.F.D. No. 2, Rockwood, Michigan 1952
Potamian, Rev. Brother A., F.S.C. Manhattan College, Riverdale, New York 71, New York 1955
Potter, Beatrice B(rown), 2111 Malvern Rd., Charlotte 7, North Carolina . 1948
Potter, David M(orris), 1557 Timothy Dwight College, Yale University, New Haven, Connecticut 1946
EM Potter, Julian K(ent), 437 Park Ave., Collingswood, New Jersey ... (1912) 1944
Potter, L(ouis) Henry, R.R. No. 1, West Rutland, Vermont 1922
Potter, N(athan) S., III, Route 5, Huntington, New York 1952
L Potts, F(red) A(ndrew), 404 S. Main St., Waupaca, Wisconsin 1922
LEM Pough, Richard H(ooper), American Museum of Natural History, Central Park W. at 79th St., New York 24, New York ..... (1922) 1947
Poulson, Thomas Layman, 216 Park Ave., Manhasset, Long Island, New York 1955
Powles, Percival M(ount), 195 St. James St., London, Ontario, Canada 1952

Poyser, Mrs. Florence E(dith), Box I, Boulder City, Nevada 1952
Prather, Mrs. Elizabeth H(unt), 400 Center Ave., Westwood, New Jersey .. 1951
Prather, Millard F(illmore), P.O. Box 559, Fairfield, Alabama 1939
Pray, Russell H(arvey), 662 Santa Rosa Ave., Berkeley 7, California 1949
FE Preble, Edward A(lexander), 3027 Newark Street, N.W., Washington, D.C. ..... (1892) 1935
Preisick, G. Roger, 23 Westminster Rd., Baldwin, New York 1955
Prendergast, J(ames) Stafford, Eden Hill, Tyrone, Pennsylvania 1949
Prescott, Dr. Kenneth Wade, Director, Kansas City Museum, 3218 Gladstone Blvd., Kansas City, Missouri 1947
Preston, Charles Putnam, 1734 South Oval Dr., Sarasota, Florida 1954
Preston, Dr. F. W., Box 149, Butler, Pennsylvania 1952
Prestwich, Arthur A(lfred), 61 Chase Rd., Oakwood, London N. 14, England 1949
Price, Rev. Richard E. Jr., The First Baptist Church, Radford, Virginia . 1955
Price, William B(ruce), 105 Rosslyn Avenue, Worthington, Ohio 1951
Primley, Walter S., c/o American Chicle Co., 405 Lexington Ave., New York 17, New York 1934
Pringle, Cornelia C(ovington), 1816 Vallejo St., San Francisco 23, California 1950
Prior, E. Gertrude, Sweet Briar, Virginia 1947
Proctor, C. L., Armour Heights Public School, 148 Wilson Ave., Toronto 12, Ontario, Canada 1952
L Procter, Mrs. Lillian S(anford), Williamstown, Massachusetts 1928
Prosser, Albert L(aurence), Box H., Springvale, Maine 1951
Provost, Ernest E(dmund), Zoology Department, Washington State College, Pullman, Washington 1952
Pruitt, Mrs. William O., Jr. (Erna Nauert), Arctic Aeromedical Lab., Ladd Air Force Base, Fairbanks, Alaska 1948
Prusiecki, Edward (Joseph), 231 N. California, Hobart, Indiana 1951
Prychodko, Dr. William, c/o Detroit Institute of Cancer Research, 4811 John R. Street, Detroit 1, Michigan 1954
Puett, Miss May W(ilson), P.O. Box 2183, Greenville, South Carolina 1952
Pulich, Warren M(ark), 2720 Frazier Ave., Fort Worth, Texas 1949
Pursell, William McClain, 511 Neilson St., Berkeley 7, California 1947
Putnam, Loren Smith, Department of Zoology, Ohio State University, Columbus 10, Ohio 1942
Putman, William L(loyd), Dominion Entomological Laboratory, Vineland Station, Ontario, Canada 1937
Pyle, Jean G., 1510 Fifth Ave., Oakland 6, California 1952
Pyle, Dr. Lewis W., 295 Harvard St., Cambridge 39, Massachusetts 1954
Pyle, Robert L(awrence), P.O. Box 949, Wahiawa, Oahu, Hawaii 1953
Quattlebaum, W(illiam) D(an), 1925 Paloma St., Pasadena 7, California 1924
Quay, Thomas L., Zoology Department, North Carolina State College, Raleigh, North Carolina 1942
Quay, Dr. W(illiam) B(rooks), Division of Mammals, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1945
Queeny, Edgar M(onsanto), Route 13, Kirkwood, Missouri 1950
Quilliam, Mrs. C. D., 86 Brock St., Kingston, Ontario, Canada 1954
Rabor, Dioscoro S(iarot), Silliman University, Dumaguete City, Negros Oriental, Philippines 1951
EM Racey, Kenneth, 6542 Lime St., Vancouver, British Columbia, Canada ..... (1921) 1950

Raitt, Ralph J., Jr., Museum of Vertebrate Zoology, University of California, Berkeley 4, California 1955
Ramsey, A(lfred) Ogden, McDonogh School, McDonogh, Maryland 1949
Ramsey, D. Hiden, Box 8115, Asheville, North Carolina 1954
Ramsey, Ralph L., 1578 N. Decatur Rd., Atlanta 6, Georgia 1947
F Rand, Dr. Austin Loomer, Chicago Natural History Museum, Roosevelt Rd. and Lake Shore Dr., Chicago 5, Illinois ..... (1927) 1943
L Randall, Clarence Belden, 700 Blackthorn Rd., Winnetka, Illinois 1948
Randall, Robert N(eal), 928 Sixteenth St., Bismarck, North Dakota 1939
Randolph, Evan, Corner of Seminole and Chestnut Aves., Philadelphia 18, Pennsylvania 1949
Rankin, Henry A(shby), Jr., Box 803, Fayetteville, North Carolina 1952
LEM Rapp, Dr. William Frederick, Jr., 430 Ivy Ave., Crete, Nebraska (1939) 1950
Rausch, Dr. Robert (Lloyd), U.S. Public Health Service, Box 960, Anchorage, Alaska 1949
L Raymond, Olney M(artin), 129 Lincoln Place, Brooklyn, New York 1930
Raynor, Gilbert S(idney), Wading River Rd., Manorville, Long Island, New York 1937
Rea, Gene, 251 Leland Ave., Columbus 1, Ohio 1954
L Read, Bayard W(hitney), Upper Dogwood Lane, Rye, New York 1949
Read, Duncan H., Middleburg, Virginia 1946
Read, Simon Jervis, 86 Warwick Gardens, London, W. 14, England 1955
L Rebmann, G(odfrey) Ruhland, Jr., 729 Millbrook Lane, Haverford, Pennsylvania 1948
Reck, Robert C., 1415 Broadway, Piqua, Ohio 1954
Redjives, C(asimir) F(rancis), 881 Washington Ave., Brooklyn 25, New York 1949
Reece, Maynard, 3405 50th St., Des Moines 10, Iowa 1948
Reed, Edward B., Department of Biology, University of Saskatchewan, Saskatoon, Canada 1953
Reed, Dr. Erik K(ellerman), National Park Service, Santa Fe, New Mexico 1953
Reed, Parker Crosby, 27 Hayes Ave., Lexington 73, Massachusetts 1948
Reeder, William Glass, 5464 Fifth Ave., Los Angeles 43, California 1955
Reese, Dr. Carl R(ichard), Ohio State University, Department of Zoology and Entomology, Columbus 10, Ohio 1953
Reese, Mrs. Robert M(iller) (Rebecca Ramsey), 219 S. St. Asaph St., Alexandria, Virginia 1920
Reeves, Henry Milton, Box 1786, 1213 W. Harrison St., Harlingen, Texas 1955
Regennas, Charles H(enry), Jr., 130 W. Lemon St., Lititz, Pennsylvania . 1950
Rehfisch, Carol, 335 Delgado St., Santa Fe, New Mexico 1948
HL Rehn, James Abram G(arfield), Academy of Natural Sciences, Logan Square, Philadelphia, Pennsylvania 1901
Reichert, Kurt, Buchhopsweg 19, (20), Soltau, Prov. Hannover, West Germany 1954
Reichert, Mrs. R(obert) J(acob) (Elsa), 14 West First St., Mount Vernon, New York 1950
Reid, Mrs. Bruce (Bessie M.), Box 883, Silsbee, Texas 1918
Reid, Donald B(urnett), Northeastern Wildlife Stn., University of New Brunswick, Fredericton, N.B., Canada 1952
Reid, Neil J., Glacier National Park, Box 382, West Glacier, Montana 1953
Reilly, Edgar M(ilton), Jr., P.O. Box 34, Old Chatham, New York 1947
Reith, Marie, 120-05 Long St., Jamaica 5, New York 1952

L Rett, Egmont Z(achary), Santa Barbara Museum of Natural History, Santa Barbara, California 1940
Reynard, George B(ergin), 728 Parry Ave., Palmyra, New Jersey 1950
Reynolds, Edgar W., 615 Louisiana Ave., Cumberland, Maryland 1954
Reynolds, Dr. Harold C., Museum of Vertebrate Zoology, University of California, Berkeley 4, California 1947
Reynolds, Dr. T. Eric, 140 Estates Drive, Piedmont 11, California 1941
Reynolds, Thomas George, 92 Pine Ridge Rd., Pine Ridge, Media, Pennsylvania 1952
Reynolds, William P(ius), 1330 Foulkrod St., Philadelphia 24, Pennsylvania 1949
HL Rhoads, Charles J(ames), Bryn Mawr, Pennsylvania 1895
Rice, Dale W(arren), U.S. Fish and Wildlife Service, Bldg. 45, Denver Federal Center, Denver 2, Colorado 1949
Rice, Mrs. Donald (Mary J.), 407 W. University, Champaign, Illinois 1954
Rice, Ward J(ennings), 5250 N. Pennsylvania St., Indianapolis 20, Indiana . 1913
Rich, Mrs. Eva, 150 W. 80th St., New York 24, New York 1946
Richards, Dr. John W(atson), R.F.D. 2, Emmitsburg, Maryland 1953
Richards, Tudor, "Hurricane Farm", Keene, New Hampshire 1949
Richardson, David L(ord), Eastern Point, Gloucester, Massachusetts 1949
L Richardson, Flora S. (Mrs. W.D.), 4318 Oakenwald Ave., Chicago 15, Illinois 1925
Richardson, Dr. Frank, Department of Zoology, University of Washington, Seattle, Washington 1939
Richter, Carl H., 703 Main St., Oconto, Wisconsin 1939
Richter, Dr. G(eorge) William, Guide Bldg., Canfield, Ohio 1951
Ricks, John T(homas), East Gate Road, Lloyd Harbor, Huntington, New York 1951
Ridgely, Dr. Beverly S(ellman), 25 Everett Ave., Providence 6, Rhode Island 1949
Riegel, Mrs. Florence B., St. Croix Falls, Wisconsin 1955
Riley, Thomas J(ames), Box 6, Brandywine Station, Schenectady, New York 1949
Rimsky-Korsakoff, V(ladimir) N(icholas), Box 735, Center Moriches, Long Island, New York 1951
LF Ripley, Dr. S(idney) Dillon, II, Peabody Museum of Natural History, Yale University, New Haven 11, Connecticut ..... (1938) 1951
Rising, Gerald R(ichard), 72 Allen's Creek Rd., Rochester 18, New York . 1952
Ritchie, Mrs. Jacqueline M(aurice), 1 Winthrop St., West Concord, Massachusetts 1951
Ritchie, Dr. Robert C(harles), 165 Alexandra Blvd., Toronto, Ontario, Canada 1944
LEM Robbins, Chandler Seymour, Patuxent Research Refuge, Laurel, Maryland ..... (1944) 1949
Robbins, Chandler Jr., Sugar Island Camps, Greenville, Maine 1934
Robbins, Mrs. Eleanor C., Patuxent Research Refuge, Laurel, Maryland . 1939
Robert, Henry C(ooke), P.O. Box 2086, Atlanta, Georgia 1949
Roberts, Bertrand, 6951 33rd St., N.W., Washington 15, D.C. 1944
Roberts, Mrs. Frances F., 1134 Glendon Ave., Los Angeles 24, California 1941
Roberts, Harold D(avis), 610 Harrison St., Black River Falls, Wisconsin . 1949
Roberts, H(oward) Radclyffe, Box 490, Bryn Mawr, Pennsylvania 1924
Roberts, Neddie O'Moore, Box 5194, Station B, New Orleans 15, Louisiana 1948
HL Roberts, William Ely, 29 W. Stratford Ave., Lansdowne, Pennsylvania ... 1902

	Robertson, Howard, 157 S. Wilton Dr., Los Angeles 4, California	1911
EM	Robertson, John McB(riar), 1677 W. 9th St., Pomona, California .. (1920)	1948
	Robertson, Dr. William B., Jr., 283 National Resources Bldg., Illinois Natural History Survey, Urbana, Illinois	1955
	Robins, C(harles) Richard, 3300 N. Third St., Harrisburg, Pennsylvania .	1948
	Robinson, Lucile W., Route 2, Box 199, Boring, Oregon	1951
	Robinson, Thane S(parks), Museum of Natural History, University of Kansas, Lawrence, Kansas	1952
	Rochaleau, David Henry, 131 Benton St., Cheboygan, Michigan	1954
	Rockefeller, William A(very), Rm. 2610, 52 Wall St., New York 5, New York	1949
	Rodts, André, Voortdyk, Noord 24, Leffinge, Belgium	1955
	Roehm, Dr. Harold R., 970 Lone Pine Rd., Bloomfield Hills, Michigan ...	1952
	Rosegay, Mary Louise (Mrs. Harold), c/o Major H. Rosegay, 98th Gen. Hosp., A.P.O. 34, New York	1942
	Roesler, M(ax) Stuart, June Road, Cos Cob, Connecticut	1949
	Roesler, Mrs. M(ax) Stuart (Carol S.), June Road, Cos Cob, Connecticut .	1949
	Roest, Dr. Aryan I., Biological Sciences, California State Polytechnic College, San Luis Obispo, California	1954
LEM	Rogers, Charles H(enry), East Guyot Hall, Princeton, New Jersey . (1904)	1921
L	Rogers, Gerald (Talbot), 587 N. Bay St., Fort Walton Beach, Florida	1941
	Rogers, John Mather, 17 Phelps St., Binghamton, New York	1938
	Rogers, John P., Stephens Hall, University of Missouri, Columbia, Missouri	1953
	Rogers, Dr. Kay T(rowbridge), Department of Zoology, Oberlin College, Oberlin, Ohio	1949
	Rogers, Thomas Henry, 1306 Dakota Ave., Libby, Montana	1947
	Rogers, Wallace, 715 Ellsworth Dr., N.W., Atlanta, Georgia	1921
	Rogers, Mrs. Walter E., 911 E. North St., Appleton, Wisconsin	1932
	Rokosky, Emil J(ames), Racine Zoological Park, 2131 N. Main St., Racine, Wisconsin	1949
L	Rollin, Noble, Primrose Cottage, Glanton, Northumberland, England	1946
	Romaine, Mrs. Lawrence B., Weathercock House, Middleboro, Massachusetts	1954
	Romanoff, Mrs. Anastasia J., Belleayre Apts., 700 Stewart Ave., Ithaca, New York	1955
	Rooney, James, Jr., 1514 S. 12th Ave., Yakima, Washington	1943
	Root, Oscar M(itchell), Brooks School, North Andover, Massachusetts ...	1940
	Rosche, Richard C., 48 Dartmouth Ave., Buffalo 15, New York	1954
	Rose, W(illiam) C(umming), 710 W. Florida Ave., Urbana, Illinois	1950
	Rosenthal, Dr. Morton Lawrence, 268 Linden Blvd., Brooklyn 26, New York	1953
	Rosin, Mrs. Katharine S., 691 W. 247th St., New York 71, New York	1955
	Ross, Aaron B(elnap), 3417 Fillmore Ave., Ogden, Utah	1947
	Ross, C(harles) Chandler, 7924 Lincoln Dr., Chestnut Hill, Philadelphia 18, Pennsylvania	1936
	Ross, Miss Edna G(race), Almonte, Ontario, Canada	1948
	Ross, Hollis T(revor), 29 S. 2nd St., Lewisburg, Pennsylvania	1947
L	Ross, J(ames) B(rent), 2408 Westminster Way, N.E., Atlanta 6, Georgia .	1949
	Ross, Dr. Lucretius H(enry), 507 Main St., Bennington, Vermont	1912
L	Ross, Mrs. Mary R.S., 455 E. Ridge St., Marquette, Michigan	1954
	Ross, Reuben J., P.O. Box 190, Georgetown, Connecticut	1922
	Ross, Roland C., 1820 Bushnell Ave., South Pasadena, California	1925

Rothschild, Brian J., 1224 Clinton Ave., Irvington 11, New Jersey 1955
F Rowan, William, Department of Zoology, University of Alberta, Edmonton, Alberta, Canada ..... (1920) 1950
Rowell, Edward Patten, 4055 Ventura Ave., Miami 33, Florida 1954
Rowinski, Ludwig J., 17 Schneider Place, Passaic, New Jersey 1947
Rowley, J(ohn) Stuart, 305 Sequoia Dr., Pasadena 2, California 1930
Royall, Willis C., Jr., Wildlife Research Laboratory, Bldg. 45, Denver Federal Center, Denver 2, Colorado 1945
Rubendall, Elizabeth, 822 W. 5th, Topeka, Kansas 1947
Rubey, William W., 5216 Westwood Dr., Washington 16, D.C. 1933
Rudd, Charles Robert, 30 Prospect Hill Rd., Lexington 73, Massachusetts . 1954
Rudd, Dr. R(obert) L., Department of Zoology, University of California, Davis, California 1939
Rudolph, Royston R(ice), Jr., Sabine National Wildlife Refuge, MRH, Box 107, Sulphur, Louisiana 1949
Rumsey, Dr. William Lacy, 1336 North Ave., Elizabeth 3, New Jersey ... 1953
Runk, Alfred E., Ramsey, New Jersey 1952
Russak, Maurice L(ouis), 1675 Metropolitan Ave., New York 62, New York 1951
Russell, Dr. L(oris) S(hano), National Museum of Canada, Ottawa, Ontario, Canada 1951
Russell, Rosemary, 25 Kenwood Rd., Tenafly, New Jersey 1953
Russell, Stephen M(ims), 267 E. Valley St., Abingdon, Virginia 1949
Russell, Dr. Whitfield Leggett, Box 22, Rhome, Texas 1941
Rutter, Russell J(ames), Box 794, Huntsville, Ontario, Canada 1928
Ryder, Ronald A(rch), c/o Utah Cooperative Wildlife Research Unit, Utah State Agricultural College, Logan, Utah 1949
Rylander, (Michael) Kent, Box 5303, North Texas Station, Denton, Texas .. 1953
Ryser, Dr. Fred A., Jr., Assistant Prof. Biology, Nevada Southern, Box 2267 Huntridge Station, Las Vegas, Nevada 1951
Sabin, Walton B., 1490 New Scotland Rd., Slingerlands, New York 1942
Sabine, Mrs. Winifred S(prague), 503 Triphammer Rd., Ithaca, New York . 1950
Sage, Evan V., R.R. 3, Waterloo, Iowa 1947
Sallee, Roy M., Department of Biology, Western Illinois State Teachers College, Macomb, Illinois 1931
Salt, Dr. George William, Division of Zoology, University of California, Davis, California 1947
Sampson, Dr. Edward, Guyot Hall, Princeton, New Jersey 1936
Sampson, W(alter) B(ehnard), 1005 N. San Joaquin St., Stockton, California 1922
Sanborn, Alvah W., Pleasant Valley Sanctuary, Lenox, Massachusetts 1946
Sandford, William F(oster), 87 Main St., Matawan, New Jersey 1951
Sanger, Mrs. Marjory B., Tenny Place, Stow, Massachusetts 1955
Sands, James Lester, 2917 Franciscan N.E., Albuquerque, New Mexico .. 1955
Sather, Carlyle Wilmar, 1290 Grove St., Apt. 204, San Francisco 17, California 1953
Satter, John M(arcus), 4500 Millersville Rd., Indianapolis 5, Indiana 1952
Satterly, Jack, 100 Castlewood Road, Toronto 12, Ontario, Canada 1947
Satterthwait, Elizabeth Allen (Mrs. Alfred Fellenberg), 775 19th Ave., S., St. Petersburg, Florida 1920
Sauer, Dr. Gordon C(henoweth), 425 E. 63rd St., Kansas City 10, Missouri 1948
Saugstad, N. Stanley, R.R. 4, Minot, North Dakota 1945
F Saunders, Aretas A(ndrews), Box 141, Canaan, Connecticut ..... (1907) 1950

EM Saunders, Dr. George B(radford), Fish and Wildlife Service, 624 Peachtree, Seventh Bldg., Atlanta 3, Georgia ..... (1925) 1947
Saunders, Richard M(errill), 9 McMaster Ave., Toronto, Ontario, Canada . 1935
LEM Savage, James, 1014 Ellicott Square, Buffalo, New York ..... (1895) 1934
Savage, Thomas, 203 E. 62nd St., New York 21, New York 1953
Savery, Don B(rooks), 8630 Chilson Rd., R.F.D. 1, Brighton, Michigan .. 1953
Savile, Dr. D(ouglas) B(arton) O(sborne), 6 Oakland Ave., Ottawa, Ontario, Canada 1949
Sawyer, Dorothy M(ay), 500 Orwood Place, Syracuse 8, New York 1936
Sawyer, Ernest Walker, 425 North June St., Los Angeles 4, California ... 1954
Scattergood, Leslie W(ayne), Fish and Wildlife Service, West Boothbay Harbor, Maine 1949
Schaefer, Oscar Frederick, 825 Merchants Rd., Rochester 9, New York .. 1916
Schaeffer, David A(lan), 1060 Joseph Ave., Rochester 21, New York 1952
Schaughency, C(harles) B(ertram), Village Rd., Green Village, New Jersey 1949
Scheele, William E(arl), The Cleveland Museum of Natural History, 2717 Euclid Ave., Cleveland 15, Ohio 1951
Scheetz, Mrs. Francis H(arley), 15 W. Old Gulph Rd., Gladwyne, Pennsylvania 1948
Scheid, Carl Patrick, 5214 Brookeway Dr., Washington 16, D.C. 1955
Schetty, Frank R(obert), 237 LaSalle Ave., Hasbrouck Heights, New Jersey 1951
Schmidt, Karl P(atterson), Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois 1950
Schmidt, Thomas B., Jr., 3700 Sharon St., Harrisburg, Pennsylvania 1947
Schnell, Jay H(eist), 1503 Bethlehem Pike, Flourtown, Pennsylvania 1952
Schnitzer, Albert, 922 Lakeside Place, Elizabeth 3, New Jersey 1945
Scholes, Robert T(hornton), U.S.O.M. La Paz, Bolivia, c/o American Embassy-Department of State Mail Room, Washington 25, D.C. ... 1948
LF Schorger, Dr. A(rlie) W(illiam), 168 N. Prospect Ave., Madison, Wisconsin ..... (1913) 1951
Schramm, Wilson C., 321 Kensington Rd., Syracuse 10, New York 1952
L Schultz, Albert B(igelow), Jr., 117 Broadway, Hewlett, New York 1948
Schumm, William G., 302 C St., La Porte, Indiana 1944
Schuster, Evelyn E., Manistique, Michigan 1954
Schwab, Larry, Kingwood, West Virginia 1955
Schwartz, C(harles) W(alsh), 131 Forest Hill, Jefferson City, Missouri ... 1951
Schwartz, Paul A., Apartado 1766, Caracas, Venezuela 1952
Schwarz, Herbert F(erlando), American Museum of Natural History, Central Park West at 79th St., New York, New York 1925
Schweitzer, Robert David, 1 Blackstone Place, Riverdale 71, New York, New York 1953
Sciple, George W(ashington), P.O. Box 1095, Emory University, Georgia .. 1949
Scotland, Dr. Minnie B(rink), 42 Continental Ave., Cohoes, New York 1936
Scott, Miss Anna Creighton, 215 Central Ave., Englewood, New Jersey ... 1955
L Scott, Mrs. Frank A., 1508 La Loma Ave., Berkeley 8, California 1954
Scott, Frederic R(obert), 115 Kennondale Lane, Richmond, Virginia 1943
Scott, Dr. Horace G(olden), 16722 Grays Bay Blvd., Wayzata, Minnesota .. 1951
Scott, Dr. Oliver K(ennard), 437 E. 13th St., Casper, Wyoming 1936
Scott, Dr. Thomas G(eorge), Game Research and Management, Illinois Natural History Survey, Urbana, Illinois 1938
Scott, Walter E(dwin), 1721 Hickory Drive, Madison 5, Wisconsin 1937

Seal, David E., 724 Napoleon St., Rockford, Illinois 1954
Sears, Joseph Alden, Hillside Rd., Northbrook, Illinois 1934
Seeber, Edward L., 213 Columbia St., Ithaca, New York 1943
Seely, Warner, 2171 Middlefield Rd., Cleveland Heights 6, Ohio 1948
Sefton, J(oseph) W(eller), Jr., San Diego Trust and Savings Bank, Box 1871, San Diego 12, California 1922
Sehl, Robert H., 7027 Hegerman St., Philadelphia, Pennsylvania 1949
Seibert, Henri C(levet), Ohio University, Athens, Ohio 1934
Seibert, Robert F., 17 Canoe Brook Rd., Short Hills, New Jersey 1949
Seiple, Stanley J., Grove City College, Grove City, Pennsylvania 1927
Seise, Mrs. John G., 305 N. Congress, Polo, Illinois 1954
Selander, Robert K(eith), Museum of Vertebrate Zoology, University of California, Berkeley 4, California 1952
Selby, Gertrude Pettit (Mrs. James A.), Lookout Point, Ridgeville, Ontario, Canada 1947
Semprun, Dr. Rodolfo J(osé), Callao No. 1460, Buenos Aires, Argentina .. 1950
Sener, Ruth, 233 Charlotte St., Lancaster, Pennsylvania 1949
Serle, Dr. William, Medical Administrative Headquarters, Victoria, Southern Cameroons, British West Africa 1955
Sette, Mrs. B(lanche) Carolyn, R.R. 2, Box 403A, Nixon, New Jersey 1949
L Shackleton, Walter H(odge), R.R. 1, Box 76A, Prospect, Kentucky 1946
Shadle, Dr. Albert R(ay), Biology Department, University of Buffalo, Buffalo, New York 1928
Shaffer, Chester M(onroe), 279 Ave. D, S.E., Winter Haven, Florida 1940
Shaftesbury, Dr. Archie D., Woman's College, University of North Carolina, Greensboro, North Carolina 1937
Shanley, Mrs. Mary A., c/o Pitometer Co., 50 Church St., New York 17, New York 1952
Sharp, Barton L(amar), 201 N. Broad St., Lititz, Pennsylvania 1931
Shaub, Benjamin Martin, 159 Elm St., Northampton, Massachusetts 1947
Shaughnessy, Winslow M., 657 Forest Ave., Glen Ellyn, Illinois 1953
HLEM Shaver, Dr. Jesse M(ilton), 1706 Linden Ave., Nashville 12, Tennessee ..... (1924) 1932
Shaw, Miss Catherine D., 7142 Marshfield Way, Hollywood 46, California . 1954
Shaw, Dr. Charles H(icks), 109-1/2 Mulberry St., Gremen, Ohio 1947
L Shaw, Henry S(outhworth), R.F.D. 1, Box 127, Westbrook, Maine 1916
Shearer, Dr. Amon R(obert), Mont Belvieu, Chambers Co., Texas 1905
Sheehan, Robert R(aymond), 815 Classen St., Norman, Oklahoma 1952
L Sheffler, William J(ames), 4731 Angeles Vista Blvd., Los Angeles, California 1928
Sheldon, Esther Almy, South Lansing, New York 1954
Shellenberger, Emmett L., Akron Museum of Natural History, 500 Edgewood Ave., Akron 7, Ohio 1954
Shelton, Leonard A(gee), 313 First National Bldg., Pomona, California 1947
Shepard, Frank P(arsons), Jr., Meadow Lane, Greenwich, Connecticut 1950
Shepherd, Prentiss, Jr., 431 Marlboro St., Boston, Massachusetts 1946
Shepherd, William M(artin), Box 414, Kenner, Louisiana 1952
Sherer, Frank A., 546 Third St., Brooklyn, New York 1944
Sherwood, Mrs. Mary P(asco), Fernow Hall, Cornell University, Ithaca, New York 1952
Shetler, Stanwyn Gerald, Route 5, Ithaca, New York 1955
Shoemaker, Carl D., 4920 Earlston Dr., N.W., Washington 16, D.C. 1938
Short, Lester L., Jr., Fernow Hall, Cornell University, Ithaca, New York 1955

	Short, Wayne, 1130 Fifth Ave., New York 28, New York	1943
EM	Shortt, T(erence) M(ichael), Royal Ontario Museum of Zoology, Queen's Park at Bloor St., Toronto, Ontario, Canada (1931)	1943
	Shreve, Benjamin, 29 Chestnut St., Salem, Massachusetts	1933
	Shufeldt, Robert W., 4201 S. Four Mile Run Dr., Arlington 4, Virginia	1954
LF	Sibley, Dr. Charles G(ald), Fernow Hall, Cornell University, Ithaca, New York (1939)	1955
	Sibley, Fred C., R.D. 1, Alpine, New York	1954
	Sick, Dr. Helmut, Fundacão Brazil Central, Avenida Nilo Pecanha 23 III, Rio de Janeiro, Brazil	1947
	Sieger, Miss Vera E., 10058 Aurora Ave., Detroit 4, Michigan	1954
	Simmang, Miss Josephine, 1016 E. Elmira St., San Antonio 2, Texas	1955
	Simmons, Albert Dixon, Apt. 8, 2425 North Park Blvd., Cleveland 6, Ohio	1955
	Simmons, Amelia (Mrs. William W.), 2742 N. Maryland, Milwaukee 11, Wisconsin	1946
L	Simmons, Edward McIlhenny, Avery Island, Louisiana	1941
L	Simmons, Grant G(ilbert), Jr., Lake Avenue, Greenwich, Connecticut	1948
L	Simmons, Grant G(ilbert), Sr., Wiccafold, Greenwich, Connecticut	1949
	Simon, Stephen W., Bluemont Rd., Monkton, Maryland	1948
	Simpson, Mrs. Minnie C., 214 Bristol St., Canandaigua, New York	1955
	Simpson, Dr. Thomas W., 601 Reynolds Bldg., Winston-Salem, North Carolina	1936
	Sims, Harold Lee, Thibodaux, Louisiana	1937
	Singleton, Albert Roland, 3968 Marburg Ave., Cincinnati 9, Ohio	1947
	Sisson, Mrs. Clyde (Kay Curtis), 1430 Wellington Drive, Columbia 4, South Carolina	1951
	Skaggs, Merit B(ryan), Dodd Rd., Route 3, Willoughby, Ohio	1951
	Skelton, Kathleen Green, 353 W. 57th St., New York 19, New York	1949
	Skillen, Dr. Donald R(alph), 530 Georgian Rd., Pasadena 3, California	1929
LF	Skutch, Dr. Alexander F(rank), Finca "Los Cusingos", San Isidro del General, Costa Rica (1930)	1946
	Slack, Miss Mabel, 1004 Everett Ave., Louisville, Kentucky	1937
	Slater, Miss H. Elizabeth, Churchton, Maryland	1953
L	Slater, H. N., Ridgeland, South Carolina	1949
	Sloan, Norman F., Rm. 314, Douglass Houghton Hall, Michigan College of Mining, Houghton, Michigan	1955
	Slocum, Mrs. J. Fred, 29 Park St., Buffalo 1, New York	1951
	Small, Arnold, 5838-1/2 West 88th St., Los Angeles 45, California	1953
	Smalley, Alfred Evans, Department of Biology, University of Georgia, Athens, Georgia	1947
	Smiley, A(lfred) K(eith), Jr., Mohonk Lake, New York	1928
	Smiley, Daniel, Mohonk Lake, New York	1928
	Smith, Allen G(ordon), Fish and Wildlife Service, Box 603, Brigham City, Utah	1948
	Smith, Earl R., Sta. B., Box 5271, New Orleans, Louisiana	1924
	Smith, E(lla) Esther, Box 462, Murphysboro, Illinois	1949
	Smith, Miss Emily D., 19651 Glen Una Dr., Los Gatos, California	1930
L	Smith, George A(rthur), 211 E. Avondale Rd., Greensboro, North Carolina	1942
	Smith, Dr. Harry M(adison), 1602 State St., Columbus, Indiana	1938
	Smith, Mrs. Herman Dunlap (Ellen Thorne), 121 Stone Gate Rd., Lake Forest, Illinois	1936
HL	Smith, Horace G(ardner), 1457 St. Paul St., Denver 6, Colorado	1888

Smith, Mrs. J(ack) Morgan, 1434 N. Morningside Dr., N.E., Atlanta, Georgia 1952
Smith, Jerome H., 4815 Erskine St., Omaha, Nebraska 1953
Smith, Miss Marion L(ucille), 429 S. Willard St., Burlington, Vermont ... 1950
Smith, Orion O., 2911 Spring Creek Rd., Rockford, Illinois 1939
Smith, Mrs. Otis H. (Anna Margaret), 207 Alexander Ave., Larkspur, California 1947
Smith, Paul Whitney, 1428 Prospect St., Mentor, Ohio 1954
Smith, Dr. Robert B.W., 424 Windsor St., Silver Spring, Maryland 1953
Smith, Robert Irvin, 567 North First East, Logan, Utah 1955
Smith, Robert L., R.R. No. 1, Reynoldsville, Pennsylvania 1944
Smith, Robert Leland, U.S. Geological Survey, G. and P., Washington 25, D.C. 1952
Smith, Robert Wayland, 137 Kenwood Ave., Oneida, New York 1954
Smith, S. Craig, 46 18th Ave., Sea Cliff, New York 1955
LEM Smith, Wendell Phillips, 711 Kensington Ave., North Wilkesboro, North Carolina ..... (1919) 1937
Smith, William Walter, 673 Milverton Blvd., Toronto 6, Ontario, Canada .. 1947
Smithe, Frank B., 7 Center Drive, Douglaston, Long Island, New York ... 1949
Smithe, F(rank) Norton, 647 E. 14th St., Apt. 4H, New York 9, New York . 1947
Smithers, Reay H.N., National Museum of Southern Rhodesia, P.O. Box 240, Bulowayo, S.R., Africa 1953
Smola, Ferdinand G., 312 Patterson Bldg., Omaha 2, Nebraska 1952
Smolker, Robert E(liot), Dept. of Natural Science, Michigan State University, East Lansing, Michigan 1952
Smooker, George D(ouglas), c/o Royal Bank of Canada, West End Branch, Cockspur St., London, S.W. 7, England 1926
Smyth, Dr. Thomas, State Teachers College, Shippensburg, Pennsylvania . 1921
Smythe, Paul E., Box 1151, Beverly Hills, California 1955
Snapp, Mrs. R(oscoe) R(aymond), 310 W. Michigan Ave., Urbana, Illinois . 1947
Snider, Mrs. Patricia Rae, P.O. Box 504, Los Alamos, New Mexico 1955
Snyder, Dr. Dana Paul, Dept. of Zoology, University of Massachusetts, Amherst, Massachusetts 1947
EM Snyder, Dorothy E(astman), The Peabody Museum, Salem, Massachusetts ..... (1943) 1955
F Snyder, L(ester) L(ynne), Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada ..... (1919) 1947
Snyder, Mildred O., 1600 Warren Ave., Warren Heights, Cheyenne, Wyoming 1955
Solman, Dr. Victor E(dward) F(rick), Canadian Wildlife Service, Department of N. Affairs and Nat. Resources, Ottawa, Ontario, Canada .. 1952
F Soper, J(oseph) Dewey, R.R. 7, South Edmonton, Alberta, Canada . (1918) 1949
L Sorrill, Anna Marie (Mrs. Tom), 1501 Kentucky St., Quincy, Illinois 1948
Southern, William E., 12041 Lorrey Rd., Fenton, Michigan 1955
Sowls, Lyle K., Rm. 205, Education Bldg., University of Arizona, Tucson, Arizona 1953
Sparke, Richard W(arrick), 157 Archer Street, Shreveport 64, Louisiana .. 1952
Sparkes, Miss Vera E., 2417 Lyndale Ave., North, Minneapolis 11, Minnesota 1954
L Speirs, Mrs. Doris Huestis, "Cobble Hill", R.R. 2, Pickering, Ontario, Canada 1937
Speirs, Dr. J(ohn) Murray, "Cobble Hill", R.R. 2, Pickering, Ontario, Canada 1935

Spencer, Don, 88 Secor Road, Scarsdale, New York 1954
Spencer, Haven H., 2645 Bedford Rd., Ann Arbor, Michigan 1947
Spencer, Dr. Merrill P., 303 Wake Dr., Winston-Salem, North Carolina . 1954
Spencer, Michael, Kirk's Ferry P.O., Quebec, Canada 1954
Spencer, Miss O(live) Ruth, 1030 25th Ave. Court, Moline, Illinois 1941
Sperry, Charles Carlisle, 1455 S. Franklin St., Denver 10, Colorado 1920
Spiers, Donald R(ichard), Timber Yard Cottage, Bradwell Grove, Burford, Oxon, England 1953
L Spingarn, Edward D(aniel) W(oodbury), 3400 Rodman St., N.W., Washington 8, D.C. 1924
Spofford, Walter R(ichardson) II, Dept. of Anatomy, State University of N. Y. Medical Center, Syracuse, New York 1927
Springer, Paul (Frederick), Patuxent Research Refuge, Laurel, Maryland . 1941
F Sprunt, Alexander, Jr., The Crescent, Charleston 50, South Carolina ..... (1923) 1950
Sprunt, Alexander, IV, 2426 Bancroft Way, Berkeley 4, California 1950
EM Squires, W(illiam) Austin, The New Brunswick Museum, Saint John, New Brunswick, Canada ..... (1946) 1950
Stabler, Harold B(rooke), 6123 Broad Branch Rd., Washington 15, D.C. .. 1937
Stabler, Dr. Robert M(iller), Colorado College, Colorado Springs, Colorado 1940
Stackpole, Richard, Wayland, Massachusetts 1937
EM Staebler, Dr. Arthur Eugene, Biology Department, Fresno State College, Fresno, California ..... (1935) 1955
EM Stager, Kenneth Earl, Los Angeles County Museum, Exposition Park, Los Angeles 7, California ..... (1942) 1953
Stahl, Marjoretta J(ean), Kimberly, West Virginia 1949
Stair, John Lester, P.O. Box 215, c/o Indian Valley Ranch, Tucson, Arizona 1955
Stallcup, William B(lackburn), Jr., Biology Department, Southern Methodist University, Dallas, Texas 1951
Staloff, Charles, 1776 Weeks Ave., Bronx 57, New York 1949
Stamm, Anne L. (Mrs. Frederick W.), 2118 Lakeside, Louisville 5, Kentucky 1946
Stanley, Dr. Willard F(rancis), State University Teachers College, Fredonia, New York 1947
Stanwood, Miss Cordelia J(ohnson), Birdsacre, High St., Ellsworth, Maine 1909
Stark, Earl (Vincent), 59 Chilton Rd., Toronto, Ontario, Canada 1948
Starner, Miss Bette A., Department of Biology, University of Florida, Gainesville, Florida 1955
Starr, Dr. Robert R(ussell), Howard Clinic, Glasgow, Kentucky 1949
Starrett, Andrew, Division of Mammals, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1949
Stasz, Clarence E., 179 Edgewood Ave., Audubon 6, New Jersey 1953
Stauffer, Dr. R(alph) S(tanley), 208 W. Irvin Ave., Hagerstown, Maryland 1949
Stearns, Dr. Edwin I(ra), 601 Lake Ave., Wilmette, Illinois 1945
Steel, William C., 551 Morningside Dr., Miami Springs, Florida 1952
Steffen, Philip N., 2135 Balmoral Ave., Chicago 25, Illinois 1949
Stegeman, LeRoy Calkins, New York State College of Forestry, Syracuse 10, New York 1953
Steilberg, Robert Hays, 555 Sunset Rd., Louisville 6, Kentucky 1952
Stein, Robert C(arrington), Fernow Hall, Cornell University, Ithaca, New York 1950

Steirly, Charles C(ornell), Virginia Forest Service, Waverly, Virginia 1947
Stepan, Dr. John D., 206 West Monsarette, El Campo, Texas 1955
Stephens, James L(inley), Jr., P.O. Box 841, Lumberton, North Carolina .. 1947
Stephenson, Stephen Neil, 212 Campus Drive, Pocatello, Idaho 1955
Stern, Herbert, Jr., 2400 General Taylor St., New Orleans 15, Louisiana . 1949
Sterner, Dr. Lewis G(eorge), Byberry Rd., Somerton, Philadelphia 16, Pennsylvania 1949
Stettenheim, Peter, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1951
Stevens, Charles E(lmo), Jr., 615 Preston Place, Charlottesville, Virginia . 1946
L Stevens, John P., Jr., Stevens Bldg., Broadway at 41st St., New York 36, New York 1939
Stevens, O(rin) A(lva), State College Station, Fargo, North Dakota 1943
EM Stevenson, Dr. Henry M(iller), Jr., Department of Zoology, Florida State University, Tallahassee, Florida ..... (1940) 1954
EM Stevenson, James O(sborne), Fish and Wildlife Service, Department of the Interior, Washington 25, D.C. ..... (1926) 1948
Stewart, Miss Mildred, 2219 Devonshire Drive, Cleveland 6, Ohio 1946
Stewart, James R. Jr., United Gas Corporation, Research Laboratory, Shreveport, Louisiana 1955
L Stewart, Paul A(lva), Department of Zoology and Entomology, Ohio State University, Columbus 10, Ohio 1928
EM Stewart, Robert Earl, Patuxent Research Refuge, Laurel, Maryland (1938) 1949
Stewart, Ronald M., Massett, Queen Charlotte Islands, B.C., Canada 1947
Stickney, Mrs. Albert, Jr., Leetes Island Rd., Guilford, Connecticut 1933
Stiles, Bruce F(leming), 601 10th St., West Des Moines, Iowa 1939
Stillwell, Jerry E., R.R. 2, Fayetteville, Arkansas 1934
Stimson, Louis A(lbert), 1835 Opeechee Dr., Miami 45, Florida 1943
Stine, Miss Perna M., R. Route No. 5, Olney, Illinois 1936
Stirrett, Dr. Geo(rge) M(ilton), Canadian Wildlife Service, Old Arts Bldg., Queen's University, Kingston, Ontario, Canada 1948
Stockdale, Thomas Michael, 1942 Iuka Ave., Columbus 1, Ohio 1955
Stoddard, E(noch) V(ine), Gallup Lane, Waterford, Connecticut 1942
LF Stoddard, Herbert Lee, Sherwood Plantation, Thomasville, Georgia (1912) 1936
Stokes, Allen W., Department of Wildlife Management, U.S.A.C., Logan, Utah 1947
Stone, Dr. Charles T., Jr., 4514 - Avenue N 1/2, Galveston, Texas 1955
Stone, Edgar Norman, 55 Almaden Court, San Francisco, California 1954
Stoner, Mrs. C. Birch, 357 Hobart Ave., Short Hills, New Jersey 1944
L Stoner, Mrs. Dayton, 399 State St., Albany, New York 1946
Stoner, Emerson A(ustin), 285 E. "L" St., Benicia, California 1922
Stophlet, John J(ermain), 2612 Maplewood Ave., Toledo, Ohio 1937
Storer, John H(umphreys), 440 Henkel Circle, Winter Park, Florida 1937
LF Storer, Dr. Robert W(inthrop), Museum of Zoology, University of Michigan, Ann Arbor, Michigan ..... (1935) 1952
EM Storer, Dr. Tracy Irwin, Dept. of Zoology, University of California, Davis, California ..... (1916) 1922
Storrie, Miss Robina, 443 S. Corona St., Denver, Colorado 1941
Stott, Kenhelm W(elburn), Jr., 3040 Helix St., Spring Valley, California .. 1944
Stout, Gardner D., 14 Wall St., New York 5, New York 1952
Stout, R. Gwynne, Edge Hill, Glenn Road, Ardmore, Pennsylvania 1940
Strabala, Lon, 1037 W. College, Alliance, Ohio 1955
Straw, Richard M(yron), Deep Springs, California, c/o PM, Dyer, Nevada . 1946

EM Street, Phillips B(orden), Route 1, Chester Springs, Pennsylvania... (1946) 1952
L Strehlow, Elmer W., P.O. Box 1443, Milwaukee 1, Wisconsin 1945
Stringham, Emerson, Box 986, Kerrville, Texas 1941
Strong, Alden M., c/o H.H. Roberts, Westport, Ontario, Canada 1952
F Strong, Dr. Reuben M(yron), 5716 Stoney Island Ave., Chicago 37, Illinois ..... (1889) 1949
Stull, Dr. William D(eMott), Rt. #1, Delaware, Ohio 1953
EM Stupka, Arthur, Route 1, Gatlinburg, Tennessee ..... (1934) 1948
Sturdevant, Carleton A(ustin), R.D. 1, Prattsburg, New York 1949
L Sturgeon, Myron T(homas), Department of Geography and Geology, Ohio University, Athens, Ohio 1938
Sturges, Franklin W., 1587 Brook Lane, Corvallis, Oregon 1951
L Sugden, Martin (James Jaffrey), 16 Alexandra Blvd., Toronto 12, Ontario, Canada 1952
Sullivan, Arthur, 197 Kingsway Ave., Winnipeg, Canada 1949
Summers, Dr. Lawrence, c/o University of North Dakota, Grand Forks, North Dakota 1953
EM Sumner, (Eustace) Lowell, Jr., Three Rivers, California ..... (1926) 1938
Sumner, Mrs. (Eustace) Lowell, Three Rivers, California 1933
Sumner, Ruth A(llerton), 420 N. 48th St., Omaha 3, Nebraska 1949
Sundell, Robert (Arnold), 94 Main St., Frewsburg, New York 1948
Suthard, James G(regory), 1881 Raymond Ave., Long Beach 6, California .. 1923
Suthers, Mrs. Derwent A., 163 Newman Rd., Rt. 2, Williamston, Michigan 1954
LF Sutton, Dr. George Miksch, University of Oklahoma, Norman, Oklahoma ..... (1910) 1936
Swanson, Carl V(ernon), 8824 Mt. Rainier Dr., Vancouver, Washington ... 1952
EM Swanson, Dr. Gustav A., Fernow Hall, Cornell University, Ithaca, New York ..... (1928) 1947
Sweatman, G(ordon) K(enneth), P.O. Box 254, Macdonald College, Quebec, Canada 1950
Swedenborg, E(rnie) D(avid), 4905 Vincent Ave., S., Minneapolis, Minnesota 1927
Sweet, Dr. Herman R., Department of Biology, Tufts College, Medford, Massachusetts 1942
Swift, Isabel H(owland), 3 Hackett Circle W., Stamford, Connecticut 1949
Swigart, Edmund K(earsley), 608 Harbor Rd., Southport, Connecticut 1951
Swinebroad, Jeff, Dept. of Botany and Zoology, Douglass College, Rutgers University, New Brunswick, New Jersey 1951
EM Taber, Wendell, 33 Lexington Ave., Cambridge 38, Massachusetts . (1933) 1948
Tabor, Miss Ava R(ogers), 305 Canal Ave., Thibodaux, Louisiana 1937
Taft, Elizabeth A., 504 N. Blakely St., Dunmore Station, Scranton, Pennsylvania 1940
Tainter, Grace, 161 Emerson Place, Brooklyn 5, New York 1952
Tallman, William S(weet), Jr., 4 Linden Place, Sewickley, Pennsylvania ... 1942
Talmadge, Robert R., Box 71, Willow Creek, California 1947
Tancock, (Montague) Monty A., 425 Crocker Rd., Sacramento 19, California 1950
Tanger, Louise F(orhey) A(rnold), 318 N. President Ave., Lancaster, Pennsylvania 1949
Tanghe, Leo J(oseph), 852 Stone Road, Rochester 16, New York 1949
Tanguay, Abbé René, Ste. Ann's College, Ste. Ann de la Pocatiere, Kamouraska Co., Quebec, Canada 1944

EM Tanner, Dr. James T(aylor), Department of Zoology, University of Tennessee, Knoxville, Tennessee ..... (1933) 1947
Tashian, Richard E(arl), 178 Canonchet Ave., Gaspee Plateau 5, Rhode Island 1949
Tasker, Ronald Reginald, 253 Old Orchard Grove, Toronto 12, Ontario, Canada 1952
Taylor, Herbert S(tanton), 1369 Fair Ave., Columbus 5, Ohio 1948
Taylor, Dr. Lewis Walter, Department of Poultry Husbandry, University of California, Berkeley, California 1925
Taylor, Dr. R(obert) L(incoln), 810 Highland Dr., Flintridge, Pasadena 3, California 1947
HLEM Taylor, Dr. Walter Penn, 424 W. Harrison Ave., Claremont, California ..... (1916) 1950
Taylor, William C., 87 E. LaCrosse Ave., Lansdowne, Pennsylvania 1955
Taylor, William E., 4667 Ironwood, Saginaw, Michigan 1952
Teachenor, Dix, 1020 W. 61st St., Kansas City 2, Missouri 1919
Teale, Edwin Way, 93 Park Ave., Baldwin, Long Island, New York 1947
Teer, James Garth, University of Wisconsin, Department of Wildlife Management, Madison, Wisconsin 1955
Tennis, Hall, 3709 Bobolink Lane, Orlando, Florida 1953
Terborgh, John W., 4582 26th St., North, Arlington 7, Virginia 1954
Terres, J(ohn) Kenneth, 345 E. 57th St., New York 22, New York 1934
EM Terrill, Lewis McIver, Ulverton, Quebec, Canada ..... (1907) 1947
EM Terry, Mrs. R. A. (Mary Ella McClellan Davidson), 1521 Escobita Ave., Palo Alto, California ..... (1920) 1932
Terry, Dr. Robert J(ames), University Club, St. Louis 3, Missouri 1919
Thacher, Louis B(artlett), Jr., 541 Gay St., Westwood, Massachusetts 1931
Thaeler, Charles S(chropp), Jr., 156 Washington Ave., Chatham, New Jersey 1953
Thatcher, Donald M(ason), 2916 Perry St., Denver 12, Colorado 1946
Thelen, Hubert Joseph, 839 Carroll St., Brooklyn 15, New York 1947
EM Thomas, Dr. Edward S(inclair), Ohio State Museum, Columbus 10, Ohio ..... (1922) 1941
Thomas, Evan Gower, 3001 Dickinson St., Camp Hill, Pennsylvania 1952
Thomas, Gerald B(amber), 5161 S. Western Ave., Los Angeles 62, California 1949
Thomas, Landon B., P.O. Box 141, Edgerton, Wisconsin 1947
Thomas, Lester St. John, Churchville, Pennsylvania 1954
Thomas, Ray, 600 Sarbonne Rd., Los Angeles 24, California 1951
EM Thomas, Ruth Harris (Mrs. Rowland), 410 E. Green St., Morrilton, Arkansas ..... (1935) 1950
Thompson, Daniel Q(uale), Ripon College, Ripon, Wisconsin 1949
Thompson, Mrs. Edwin V., Upper River Road, R.R. 1, Box 451, Louisville, Kentucky 1954
Thompson, James D(illey) Jr., 509-1/2 Polk St., Amarillo, Texas 1951
Thompson, Lovell, Houghton Mifflin Co., 2 Park St., Boston 7, Massachusetts 1955
Thompson, Reynolds W., 537 Verna Hill Road, Fairfield, Connecticut 1955
Thompson, William Lay, Department of Zoology, University of California, Berkeley 4, California 1953
Thomsen, Dr. Lillian Clara, Mary Baldwin College, Staunton, Virginia 1954
Thomson, Isabel A., 5939 Shafter Ave., Oakland 18, California 1952
Thomssen, Mrs. Sylvia L., 56 Avon Road, Berkeley 7, California 1955

Thorley, Robert F., 8 Midland Gardens, Bronxville 8, New York 1947
Thornburg, Ashley A(lvin), 307 South Wheeler, Victoria, Texas 1950
L Thorne, Oakleigh II, 1201 Balsam, Boulder, Colorado 1947
Thornton, William J., P.O. Box 1011, Birmingham, Alabama 1938
Thornton, Dr. Wilmot A(rnold), 124 Washington St., South Norwalk, Connecticut 1949
Thorp, George B(oulton), Carnegie Institute of Technology, Pittsburgh 13, Pennsylvania 1935
Thorpe, James D., 9 Elmdale Ave., Akron 13, Ohio 1942
Thorson, Thomas B(ertel), Entomology and Zoology Department, South Dakota State College, Brookings, South Dakota 1948
Throne, Alvin L., Wisconsin State College, Milwaukee 11, Wisconsin 1954
Thurston, Henry, Box 214, Montrose, New York 1947
Todd, H(enry) O(liver), Jr., P.O. Box 259, 105 Spring St., Masonic Bldg., Murfreesboro, Tennessee 1939
Todd, Mrs. Ruth McInnis, 2260 Terrace Ave., Baton Rouge, Louisiana 1954
F Todd, W(alter) E(dmond) Clyde, Carnegie Museum, Pittsburgh 13, Pennsylvania ..... (1890) 1916
Tomich, P(rosper) Quentin, Department of Zoology, University of California, Davis, California 1945
EM Tomkins, Ivan Rexford, 1231 E. 50th St., Savannah, Georgia ..... (1928) 1939
L Tompkins, Victor N(orman), 524 Madison Ave., Albany 3, New York 1949
Toner, George Clive, Highland Grove, Ontario, Canada 1948
EM Tordoff, Dr. Harrison B., Museum of Natural History, University of Kansas, Lawrence, Kansas ..... (1944) 1951
L Tousey, Miss Katherine, 22 Grand-View Ave., Somerville 43, Massachusetts 1935
Tousey, Dr. Richard, 6625 Oxon Hill Rd., S.E., Washington 21, D.C. 1943
Towe, J(ay) Troy, General Delivery, Cana, Virginia 1949
Townes, George F(ranklin), 209 Masonic Temple, Greenville, South Carolina 1953
Townsend, David Caldow, Stephen F. Austin State College, Nacogdoches, Texas 1953
Townsend, Miss Elsie W., Department of Biology, Wayne University, Detroit 1, Michigan 1951
Toyne, Mrs. George W., c/o Ralph Marcue, R. 2, Le Mars, Iowa 1952
Trainer, John E(zra), Muhlenberg College, Department of Biology, Allentown, Pennsylvania 1937
Trask, Dr. Parker Davies, 240 Southampton Ave., Berkeley 7, California . 1936
F Trautman, Dr. Milton Bernard, Ohio State Museum, Columbus 10, Ohio ..... (1924) 1955
EM Traylor, Melvin Alvah, Jr., 759 Burr Ave., Winnetka, Illinois .... (1940) 1950
Trivette, Edward C(arroll), Department of Zoology, State College of Washington, Pullman, Washington 1950
Trowern, Robert Wilson, 42 Van Dusen Blvd., Toronto, Ontario, Canada .. 1947
Tryon, Clarence A., Jr., Department of Biological Sciences, University of Pittsburgh, Pittsburgh 15, Pennsylvania 1947
L Tucker, Carll, Mt. Kisco, New York 1929
L Tucker, Mrs. Carll, 733 Park Ave., New York, New York 1924
Tucker, Robert E(dward), 245 N. Auburndale St., Memphis, Tennessee ... 1944
L Tufts, Dr. Harold F(reeman), Port Mouton, Queen's County, Nova Scotia, Canada 1947
Tulinoff, A(ntonine) V., 1255 Wyoming Ave., Niagara Falls, New York ... 1949

Turner, James H(oward), Box 691, Holloman Air Force Base, New Mexico . 1951
Twiss, Dr. A. R., 2359 Gails Ave., Chehalis, Washington 1955
EM Twomey, Arthur Cornelius, Carnegie Museum, Pittsburgh, Pennsylvania ..... (1930) 1946
Tyrrell, W(illiam) Bryant, 246 Park Ave., Takoma Park 12, Maryland 1940
Udvardy, Dr. Miklos Dexso Ferenc, Department of Zoology, University of British Columbia, Vancouver, British Columbia 1953
EM Uhler, Francis M(orey), Fish and Wildlife Service, Patuxent Research Refuge, Laurel, Maryland ..... (1924) 1937
Ulrich, Mrs. Alice E., 193 La Salle Ave., Buffalo 14, New York 1935
Ulrich, Edward C., 193 La Salle Ave., Buffalo 14, New York 1935
L Underdown, Henry T(ener), 8216 Manor Rd., Elkins Park, Pennsylvania .. 1921
Underhill, B. A., 4509 Burlington Place, N.W., Washington 16, D.C. 1955
Ussher, R(ichard) D(avey), R.R. 1, Morpeth, Ontario, Canada 1931
Vaiden, M(eredith) Gordon, Box 248, Rosedale, Mississippi 1936
Valentine, Allen Eugene, 2335 Walters Rd., Westlake, Ohio 1954
Van Cleve, G. Bernard, 323 S. Fairmount St., Pittsburgh 32, Pennsylvania 1954
Vandermeer, Dr. B(illy) L(ee), 251 East 17th South, Salt Lake City, Utah . 1951
Van Deusen, Hobart Merritt, 12 Highland Ave., Montclair, New Jersey ... 1937
Van Dyke, Tertius, Washington, Connecticut 1930
Vanek, Mrs. Charles W., 7441 Reuter Ave., Dearborn 1, Michigan 1954
Van Eseltine, Dr. William Parker, Department of Veterinary Hygiene, School of Veterinary Medicine, University of Georgia, Athens, Georgia 1944
L Van Fleet, Clark C., Box 696, Lakeport, Lake County, California 1947
Van Gelder, Richard G., Museum of Natural History, University of Kansas, Lawrence, Kansas 1955
Van Hoose, South G., Dyche Hall, University of Kansas, Lawrence, Kansas 1955
Van Horn, Donald H., US55436840 9963 TU, Valley Forge Army Hospital, Phoenixville, Pennsylvania 1952
Van Huizen, Peter J., White River National Wildlife Refuge, St. Charles, Arkansas 1939
Van Iziendoorn, A(ntonius) L(ambertus) J(ohan), Korenmarkt 1, Hoorn, Holland 1950
HL Van Name, Willard Gibbs, American Museum of Natural History, Central Park West at 79th St., New York 24, New York 1900
Van Tyne, Dr. Helen Bates (Mrs. Josselyn), 405 Awixa Rd., Ann Arbor, Michigan 1950
LF Van Tyne, Dr. Josselyn, University of Michigan, Museum of Zoology, Ann Arbor, Michigan ..... (1922) 1936
Varney, B(enjamin) Earl, 314 Maine St., Brunswick, Maine 1947
Vaughan, William C(oleman), Locust Grove Farm, River Road, Youngstown, New York 1935
F Vaurie, Dr. (Auguste Jean) Charles, American Museum of Natural History, Central Park West at 79th St., New York 24, New York ..... (1944) 1949
Vergeer, Dr. Teunis, 321 Princeton St., Grand Forks, North Dakota 1955
Verges, Eugene M(arcelin), II, 1126 Beacon St., Brookline, Massachusetts 1931
Vernon, Dr. James W(illiam), Broadoaks Sanatorium, Morganton, North Carolina 1937
Vincent, Brother I, F.S.C., Saint George High School, Evanston, Illinois . 1955
EM Vogt, William W., 410 Central Park West, New York 25, New York . (1928) 1936
Vollmar, Mrs. R(hea) Lewis, 6138 Simpson Ave., St. Louis 10, Missouri . 1949

Von Bloeker, Jack C(hristian), Jr., Life Sciences Department, Los Angeles City College, Los Angeles 29, California 1941
Von der Heydt, James A(rnold), P.O. Box 156, Nome, Alaska 1953
Vore, Marvin E(lmer), 1128 N. 8th Ave., West Bend, Wisconsin 1949
Wachenfeld, Mrs. William A., 787 E. Clarke Place, Orange, New Jersey . 1953
Wade, Douglas Edward, 3403 Duncan St., Columbia, South Carolina 1946
HL Wade, Joseph Sanford, Argonne Apts., 1629 Columbia Rd., N.W., Washington 9, D.C. 1929
Wagner, Mrs. Julia E(lizabeth), 818 E. Boulder St., Colorado Springs, Colorado 1949
Wainwright, C(arroll) L(ivingston), Jr., One East End Ave., New York 21, New York 1950
Walcott, Dr. Charles F., 81 Sparks St., Cambridge 38, Massachusetts ... 1952
Walcott, Robert, 912 Barristers Hall, Pemberton Square, Boston, Massachusetts 1924
Waldbauer, Gilbert Peter, 43 Elizabeth St., Bridgeport, Connecticut 1945
L Walgreen, Mrs. Charles R., 3240 Lake Shore Dr., Chicago 13, Illinois .. 1951
Walker, Alan N(ewton), 15480 Holmur, Detroit 21, Michigan 1952
EM Walker, Dr. Charles F(rederick), Museum of Zoology, University of Michigan, Ann Arbor, Michigan ..... (1927) 1944
Walker, Jason A(lison), 89 Church St., Waterloo, New York 1948
Walker, Mrs. Richard D(exter), 78 Farlow Road, Newton 58, Massachusetts 1953
Walker, Dr. Roland, Rensselaer Polytechnic Institute, Biological Laboratory, Troy, New York 1924
LF Walkinshaw, Dr. Lawrence H(arvey), 1703 Wolverine Tower, Battle Creek, Michigan ..... (1929) 1951
EM Wallace, Dr. George J(ohn), 517 Ann St., East Lansing, Michigan .. (1935) 1945
Wallace, Roy Frederick, 63 Dupont St., Toronto 5, Ontario, Canada 1947
Wallace, Tom, Louisville Times, Louisville 2, Kentucky 1954
Walsh, David Alfred, Box 223, College, Alaska 1953
Walter, Cedric N(orman), 32 Stanley Avenue, Beckenham, Kent, England .. 1948
Walters, Frank, Hollis, New Hampshire 1902
Wanamaker, John, Principia College, Elsah, Illinois 1946
Wanek, Mrs. Ernest E. (Anna N.), 5 Davidson Ave., Ramsey, New Jersey 1953
Wanless, Harold R., 127 Natural History Bldg., University of Illinois, Urbana, Illinois 1947
Wanzer, James Olin, 3601 56th St., Sacramento 20, California 1947
Ward, Arthur, 375 7th East, Swift Current, Saskatchewan, Canada 1950
Ward, Charles L(akeman), Jr., 15 Monument St., Concord, Massachusetts 1950
Ward, John Langdon, 111 Court St., Dedham, Massachusetts 1955
Warfield, Ben(jamin) Breckinridge, 3223 Volta Place, N.W., Washington 7, D.C. 1930
Warham, John, c/o Aust. & N. Z. Bank Ltd., Town Hall Branch, 608 Hay St., Perth, Western Australia 1952
Waring, John D., Anzac, Alberta, Canada 1953
Warren, Donald H., 52 South Ireland Place, Amityville, L.I., New York .. 1955
Warters, Miss Mary Ellen, 5115 Woodland Ave., Des Moines 12, Iowa ... 1951
Washington, Mrs. Whiting, Trail's End, North Edgecomb, Maine 1947
Wass, Marvin F., Rt. 3, Box 93-L, Tallahassee, Florida 1952
Wasserfall, William, 22 Roycrest Ave., Lansing, Ontario, Canada 1952
Waters, Joseph H., 24 Winter St., Whitman, Massachusetts 1955
Watson, C(harles) G(ray), 201 Ridout St., S., London, Ontario, Canada .. 1919

Watson, Frank G(raham), 4110 Drummond St., Houston 25, Texas 1936
Watson, Robert J., P.O. Box 75, Blacksburg, Virginia 1947
Wayland-Smith, Robert, 137 Kenwood Ave., Oneida, New York 1953
Weart, Miss Edith L(ucie), 35-36 76th St., Jackson Heights, New York 1946
Weaver, Miss Madeline M(ary), 161 Norton St., Rochester 21, New York .. 1953
Webb, Edward L., 254 E. 2nd St., Mesa, Arizona 1955
Weber, Jay Anthony, 10775 N. Bayshore Drive, Miami 38, Florida 1907
Webster, Clark G(ibbons), Patuxent Research Refuge, Laurel, Maryland ... 1948
Webster, Harry Reid, 433 Post Office Bldg., Edmonton, Alberta, Canada .. 1949
Webster, Dr. J(ackson) Dan, Hanover College, Hanover, Indiana 1941
Webster, Karl B(liss), 57 Webster Park Ave., Columbus 14, Ohio 1949
Webster, Randall, 341 Western Ave., Brookville, Pennsylvania 1937
Weeks, Glenn, 218 Plain Rd., Greenfield, Massachusetts 1954
Weeks, Mangum, 219 N. Royal St., Alexandria, Virginia 1938
Weidner, George J., 199-10 116 Ave., St. Albans 12, New York 1954
Weinberg, Rubin, 32 Monroe St., BB-1, New York 2, New York 1954
Weise, Charles M(artin), Biology Department, Fisk University, Nashville 8, Tennessee 1948
Weiser, Charles S(pangler), Wyndham Hills, York, Pennsylvania 1916
Weller, Milton W(ebster), Wildlife Cons. Bldg., Columbia, Missouri 1952
L Welling, Yens M., 1828 E. 5th St., Anderson, Indiana 1924
Wellings, Dr. S(efton) R(obert), 267 Parnassus Ave., San Francisco, California 1949
Wellman, Mrs. Cora B., Bank Village R.D., Greenville, New Hampshire .. 1954
Wells, LaRue, 807 W. Liberty, Ann Arbor, Michigan 1952
Welty, (Joel) Carl, R. 1, Beloit, Wisconsin 1948
Wendt, Lorina M., Apt. 404, 2377 Champlain St., N.W., Washington 9, D.C. 1946
Werner, Ray C(owles), 758 Wildwood Rd., N.E., Atlanta 9, Georgia 1947
Werner, Mrs. Tyrrell H., 100 Tolman St., Cumberland Mills, Maine 1952
Wernicke, Mrs. J. F. (Maleta Moore), Rt. 6, Box 39, Pensacola, Florida .. 1946
Werning, J.R., 1700 Third Ave., Walnut Creek, California 1955
Wesseling, Kurt (Paul), 9852 Madison, Rock Hill 19, Missouri 1949
West, David A., Fernow Hall, Cornell University, Ithaca, New York 1954
West, Mrs. E(ugene) M. (Adele Hooker), 1625 S. Clayton Ave., Chattanooga 4, Tennessee 1951
West, George C(urtiss), Vivarium Bldg., Wright and Healey Sts., Urbana, Illinois 1951
West, Henry C(lopton), 5820 Crittenden Ave., Indianapolis 21, Indiana 1950
F Weston, Francis Marion, 2006 E. Jordan St., Pensacola, Florida .. (1925) 1953
Weston, Henry G(riggs) Jr., Dept. of Biological Sciences, San Jose State College, San Jose 14, California 1943
Weston, Robert, Old Ferry Rd., North Castine, Maine 1946
Wetherbee, David Kenneth, 11 Dallas St., Worcester, Massachusetts 1945
Wetherbee, Mrs. Kenneth B(rackett), 11 Dallas St., Worcester, Massachusetts 1929
LF Wetmore, Dr. Alexander, Smithsonian Institution, Washington 25, D.C. ..... (1908) 1919
Weydemeyer, Winton (William), Fortine, Montana 1925
Weyl, Edward S(tern), 3827 The Oak Rd., Philadelphia 29, Pennsylvania ... 1921
L Wharton, William Pickman, Groton, Massachusetts 1907
Wheat, Maxwell C., 67-35 180 St., Flushing, Long Island, New York 1955
Wheatland, Sarah B(igelow), 99 Howe St., New Haven, Connecticut 1951

Whelan, Mary-Elizabeth, 310 Amity, Muskegon, Michigan 1951
Whigham, Mrs. Andrew L(ee), P.O. Box 235, Century, Florida 1939
Whitaker, Mrs. Lovie M., 1204 W. Brooks St., Norman, Oklahoma 1952
White, Keith L(ynde), Hart Mt. Nat. Antelope Refuge, Plush, Oregon 1951
Whiting, Robert A(rchie), 2521 Cobb Road, Jackson, Michigan 1949
Whitman, F(rank) Burton, Jr., Mere Point Road, Brunswick, Maine 1951
Whitney, Dr. Nathaniel Ruggles, Jr., 4350 Meadowwood Drive, Rapid City, South Dakota 1947
Whittles, Dr. Lee Jay, 2205 Main St., Glastonbury, Connecticut 1951
Wicke, A(lfred) F(rederick), Jr., 1515 N. "A" St., Pensacola, Florida 1949
Wicks, Mrs. Judon L. (Gertrude Perrott), 2615 Park Ave., Apt. 407, Minneapolis 7, Minnesota 1922
L Wickstrom, George M(artin), 2293 Harding Ave., Muskegon, Michigan 1951
Wiebush, Joseph Roy, 15 Sunset Dr., Carlisle Hill, Chillicothe, Ohio 1952
Wiens, Johnny, 428 Chautauqua, Norman, Oklahoma 1955
Wiggin, Henry T., 151 Tappan St., Brookline 46, Massachusetts 1955
Wiggins, Dr. Ira L., Natural History Museum, Stanford University, Stanford, California 1954
Wilcox, Dr. Harry Hammond, 1031 Marcia Rd., Memphis 17, Pennsylvania 1938
Wilcox, Stephen LeRoy, Speonk, Long Island, New York 1927
HL Wilcox, Thomas Ferdinand, Smith Ridge, New Canaan, Connecticut 1895
Wilder, T(heodore) G(arfield), 125 Oxford Rd., Waukesha, Wisconsin 1946
Wiles, Dr. Harold O(liver), 537 Campbell Ave., Kalamazoo, Michigan 1939
Wilhelm, Eugene J., Jr., 4725 Lee Ave., St. Louis 15, Missouri 1953
Wilk, Albert L(awrence), R.R. No. 2, Camrose, Alberta, Canada 1936
EM Williams, C(ecil) S(loan), Fish and Wildlife Service, Department of the Interior, Washington 25, D.C. ..... (1937) 1950
Williams, Cletis, Poultry Department, Oklahoma A. and M. College, Stillwater, Oklahoma 1953
Williams, Edward A(lexander), 1415 Pullan Ave., Cincinnati 23, Ohio 1950
Williams, Ellison A(dger), 27 Limehouse St., Charleston, South Carolina . 1923
EM Williams, George G., The Rice Institute, Houston 1, Texas ..... (1944) 1952
Williams, Helen J(ackson), Arlington Towers, 129 N. Arlington Ave., Apt. 4T, East Orange, New Jersey 1950
Williams, Miss Hilda W., 52 Upland Road, Brookline 46, Massachusetts .. 1954
EM Williams, Laidlaw (Onderdonk), R.F.D., Route 1, Box 152, Carmel, California ..... (1919) 1949
L Williams, Ralph Ben, Box 2354, Juneau, Alaska 1942
Williams, Raymond E(well), P.O. Box 193, Hawthorne, California 1950
Williams, William E(rnest), 218 Glen Park Ave., Toronto 10, Ontario, Canada 1951
Williamson, Francis S(idney) L(anier), Arctic Health Research Center, P.O. Box 960, Anchorage, Alaska 1949
Willis, Cornelius G(rinnell), 1 Carter Ave., Sierra Madre, California 1948
Willis, Edwin (O'Neill), 1631 Gail Road, Baltimore 21, Maryland 1952
Willis, Myra G., 1720 6th Ave., S.E., Cedar Rapids, Iowa 1949
Willms, A(lbert) George, Route 2, Urbana, Illinois 1952
Willoughby, John E(rnest), 106 Worden Ave., Ann Arbor, Michigan 1947
Wills, Camilla Louise, 1601 Grady Ave., Charlottesville, Virginia 1952
Wilmoth, James H(erdman), Harpur College of State University of New York, Endicott, New York 1949
Wilson, Archie F(rancis), 390 Hartshorn Dr., Short Hills, New Jersey 1937
Wilson, Bruce V., 815 N. Chipman St., Owosso, Michigan 1947

Wilson, Crystal Faye, Union P.O. 9426, Tucson, Arizona 1955
Wilson, Harold C., Ephraim, Wisconsin 1946
Wilson, Jerald (Junior), 316 7th St., Riverdale, North Dakota 1951
Wilson, Stuart S., Jr., Koo Koose Farm, Deposit, New York 1954
Wilson, Vanez T., Bear River Migratory Bird Refuge, Brigham, Utah 1947
Wilson, Winifred Edith, 231 Elm Ave., Westmount, Montreal 6, Quebec, Canada 1947
Wilton, Dr. Christine, Box 123, East Carolina College, Greenville, North Carolina 1954
Wiltshire, Mrs. Grace T., Randolph-Macon Woman's College, Lynchburg, Virginia 1954
L Wineman, Andrew, 150 Michigan Ave., Detroit 26, Michigan 1932
Wing, Mrs. Anne Hinshaw, 3875 Vorhies Rd., Ann Arbor, Michigan 1948
L Wing, Harold F., 7165 Bunker Hill Rd., Jackson, Michigan 1942
EM Wing, Dr. Leonard W(illiam), 3875 Vorhies Rd., Ann Arbor, Michigan ..... (1929) 1945
Wingate, David B(alcombe), 214 Linden Ave., Ithaca, New York 1951
Winn, Dr. Hudson S(umner), Department of Biology, New York State College for Teachers, Albany 3, New York 1949
Winslow, Roy C., General Delivery, Arcadia, Florida 1955
Wise, Robert William, 5127 Briggs Ave., La Crescenta, California 1953
Wisner, Herbert P., 41 Fellows St., Unadilla, New York 1954
Witherington, Robert H., 996 Kearns Ave., Winston-Salem, North Carolina 1953
EM Witschi, Dr. Emil, P.O. Box 585, University of Iowa, Iowa City, Iowa ..... (1939) 1946
Wolf, Larry L., 2609 Jefferson Ave., Midland, Michigan 1955
Wolfarth, Floyd P(arker), 133 High St., Nutley, New Jersey 1937
LEM Wolfe, Col. L(loyd) R(aymond), Route 1, Box 228-A, Kerrville, Texas ..... (1929) 1951
Wolff, John L., 859 North St., Peekskill, New York 1948
F Wolfson, Dr. Albert, Dept. of Biological Sciences, Northwestern University, Evanston, Illinois ..... (1941) 1952
Wolk, Robert G(eorge), Fernow Hall, Cornell University, Ithaca, New York 1952
Wood, Charles, 159 Summit St., East Providence 14, Rhode Island 1950
Wood, Dr. Harold Bacon, 3016 N. Second St., Harrisburg, Pennsylvania .. 1929
Wood, Merrill, Department of Zoology and Entomology, Pennsylvania State University, University Park, Pennsylvania 1927
Wood, Rawson L(yman), 5 Bonnie Heights Rd., Manhassett, New York 1942
Wood, Mrs. Rollin D., 181 de Wundt Rd., Winnetka, Illinois 1955
EM Woodbury, Dr. Angus Munn, 248 University St., Salt Lake City 2, Utah ..... (1942) 1950
Woodford, James (Jim) K., 233 Roehampton Ave., Toronto 12, Ontario, Canada 1953
L Woods, Robert, P.O. Drawer 32, Covina, California 1926
L Woodward, Miss Barbara, Rockwood, Maine 1946
L Woodward, Sarah J(ones), 33 Warren St., Concord, New Hampshire 1950
Wooldridge, Jasper, 2942 Copper St., El Paso, Texas 1952
L Woolfenden, Glen Everett, Museum of Natural History, University of Kansas, Lawrence, Kansas 1947
Woolfenden, Mrs. Harriet B(ergtold), Ter. 6, 4600 Firestone Ave., Dearborn 2, Michigan 1951
Woolman, Edward, Haverford, Pennsylvania 1925

	Work, Dr. Telford H., The Rockefeller Foundation, Virus Research Centre, P.O. Box 11, Poona 1, India		1944
	Workman, William Hughes, Lismore, Windsor Ave., Belfast, Ireland		1928
	Worth, Dr. C(harles) Brooke, 516 Walnut Lane, Swarthmore, Pennsylvania		1927
	Worthley, Dr. Elmer G., Bonita Ave., Owings Mills, Maryland		1953
EM	Wright, Dr. Albert H(azen), 133 E. Upland Rd., Ithaca, New York -	(1906)	1919
	Wright, A(lbert J(ay), II, c/o J.S. Bache and Co., Ellicott Square, Buffalo, New York		1940
L	Wright, Bruce S(tanley), Northeastern Wildlife Station, University of New Brunswick, Fredericton, New Brunswick, Canada		1946
	Wright, Mrs. Harriett H., Rt. 13, Box 184 D, Birmingham, Alabama		1954
	Wright, Howard F(ord), 3604 N. Temple Ave., Indianapolis 18, Indiana		1949
	Wright, J. Kenneth, Jr., 1430 Remington Rd., Penn Wynne, Philadelphia, Pennsylvania		1955
	Wright, Miss Jean M(cClellan), 714 S. Crescent Avenue, Cincinnati 29, Ohio		1954
	Wright, John T(homas), Route 5, Box 953, Tucson, Arizona		1947
	Wright, Dr. Philip L., Montana State University, Missoula, Montana		1942
	Wycoff, Dr. Ray S(heppard), 106 W. 7th St., Lexington, Nebraska		1949
	Wylie, William Lewis, 1310 National Rd., Wheeling, West Virginia		1949
	Wynne, James, Enderby, British Columbia, Canada		1953
LEM	Wynne-Edwards, V(ero) C(opner), Natural History Department, Marischall College, University of Aberdeen, Aberdeen, Scotland	(1930)	1936
	Yatsuhashi, Dr. Masao, 66 Beals St., Brookline 46, Massachusetts		1941
	Yeatman, Harry C(lay), Department of Biology, University of the South, Sewanee, Tennessee		1947
EM	Yeatter, Dr. Ralph Emerson, Illinois State Natural History Survey, Urbana, Illinois	(1926)	1948
EM	Yocom, Dr. Charles F(rederick), Game Management Department, Humboldt State College, Arcata, California	(1947)	1952
	Yohe, Walter E(dwin), Klinesville, R.D. 1, Columbia, Pennsylvania		1949
EM	Young, Dr. Howard Frederick, Department of Biology, Wisconsin State College, La Crosse, Wisconsin	(1947)	1954
	Young, J. Addison, II, 60 Argyle Ave., New Rochelle, New York		1949
	Young, Mrs. L. Z., 323 N. 12 Ave., Broken Bow, Nebraska		1952
	Zardus, Maurice John, Jr., Fernow Hall, Cornell University, Ithaca, New York		1954
F	Zimmer, Dr. John T(odd), American Museum of Natural History, Central Park West at 79th St., New York 24, New York	(1908)	1933
	Zimmerman, Dale A., 480 N. Almont Ave., Imlay City, Michigan		1946
	Zimmerman, Harold Alexander, 2218 N. Linden St., Muncie, Indiana		1929
	Zimmerman, James H(all), 2214 Van Hise Ave., Madison 5, Wisconsin		1949
	Zimmerman, John L., 1515 Franklin Ave., Cincinnati 37, Ohio		1953
	Zuill, Henry Alan, Smith's Parish, Bermuda		1953
	Zuloaga, Dr. Guillermo, Creole Petroleum Corporation, Apartado 889, Caracas, Venezuela, South America		1951
	Zusi, Richard, 928 S. Forest, Ann Arbor, Michigan		1953